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Financing Small-Holder Cattle Fattening in Indonesia: Integrating Demand, Supply and Institutions

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Abstract

Cattle play an important role in Indonesia as a source of income for producers to meet household needs. However, numerous studies document the low productivity and returns from cattle production and measures to address this have met with variable results especially in the semi-subsistence cow-calf sector. One possible strategy to increase productivity and incomes is the development of a more commercialised and specialised household cattle fattening sector, which would also "pull through" demand for feeder cattle from the cow-calf sector. The development of a more commercialised and specialised household fattening sector is constrained by a number of factors including resources and management expertise, but a major constraint is access to capital.

This research examines the demand for capital (from farmers), the supply of finance (from formal lending institutions) and the institutional environment in which this particular capital market operates. The research is framed by a detailed analysis of the banking and cattle sectors in Indonesia, which then focuses on cases and models in East Java with different agro-climatic or institutional settings. Using a comparative case study approach, the research identifies the factors that have led to successful or unsuccessful "finance for fattening" models, and the lessons that might promote transferability of the models to other places. Multiple sources of data are cross-verified and mixed qualitative and quantitative methods are used including detailed stakeholder interviews (with banks, government, agribusiness actors and representative household types) supplemented by surveys (conducted with different types of farmers, with and without access to credit).

Results show that credit plays an important role in cattle fattening, especially in financing the purchase of feeder cattle, feed and infrastructure. There is therefore high demand for bank loans amongst cattle fattening households. However, that it can be difficult for smaller farmers to access capital. From those who did not obtain credit (47% of total respondents), 26% of them did not have enough information about the loan facilities and application process, and the remainder were unsuccesful because they could not understand loan procedures, meet collateral requirements or repay interest or loans. Surveys also show that more wealthy households have better access to credit than less wealthy households because they are more likely to have large landholdings which provides security for bank loans, as well as regular income from off-farm sources or from cattle and are more likely to participate in farmers' groups.

On the supply side, fattening households can access finance from both informal sources (neighbours or family especially through cattle raising and profit sharing arrangements)

and formal markets (from government, banks or private companies involved especially in corporate responsibility schemes). Surveys results reveal that 85% of households surveyed accessed finance through formal bank loans, where interest rates are commonly subsidised by large government and corporate programs. This “program credit” is profitable for the banks if they can loan to large numbers of customers in groups and achieve a high rate of return (13%). Analysis in this thesis shows that household cattle fattening is cashflow positive under most scenarios, especially with subsidised credit with an effective interest rate for farmers of 6%. Despite these positive settings, banks have only been able to loan out 48% of the total allocated subsidised capital for livestock.

Thus, where there would appear to be both high demand and high supply of bank finance available, especially under subsidised schemes, supply and demand has not always “joined up” or intersected. There are a range of possible reasons including high risks and transaction costs, or shortfalls in information, management and production levels at village levels. A major finding of this thesis is that institutional settings are critical in linking up the demand and supply of credit. In this regard, intermediate organisations including government agencies, research technical agencies, agribusiness actors, farmers’ groups, cooperatives and private companies play an important role.

In sum, successful and sustainable “finance for fattening” models show a range of common characteristics: efficient household fattening operations; active farmer groups that provide support and reduce transaction costs; links to agribusiness actors to facilitate cattle marketing; and technical support from government and research agencies.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

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Mahendri, IGAP, Waldron, S, Wegener, M & Cramb, RA 2018, 'Factors influencing farmers uptake of credit for cattle fattening in two districts in East Java, Indonesia', in *Proceedings of the International Conference on Livestock Value Chain and Access to Credit*, Ezulwini, Swaziland, pp. 46-52.

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Contributor	Statement of contribution
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Prof. Dr. Rob Cramb	Conception and design (10%) Analysis and interpretation (5%) Drafting and production (10%)
Dr. Malcom Wegener	Conception and design (10%) Analysis and interpretation (5%) Drafting and production (10%)

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Contributions by others to the thesis

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Research Involving Human or Animal Subjects

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Cattle fattening, Eastern-Indonesia, credit programs, lending institutions, farmers' groups, small-farmers

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List of Abbreviations

No	Abbreviations	English term	Indonesian term
A	**Institution**		
1.	AIAT/BPTP	Assessment Institute for Agricultural Technology	Balai Pengkajian Teknologi Pertanian
2.	BCATRES	Beef Cattle Research Station	Loka Penelitian Sapi Potong
3.	BKP	Coordinating agency for extension	Badan Koordinasi Penyuluhan
4.	BNI	Indonesian State Bank	Bank Negara Indonesia
5.	BP2KP	Executive Agency for Extension and Food Security	Badan Pelaksana Penyuluhan dan Ketahanan Pangan
6.	BPD Jatim	Regional Development Bank	Bank Pembangunan Daerah Jatim
7.	BPR	Rural bank	Bank Perkreditan Rakyat
8.	BPS	Central Bureau of Statistics	Badan Pusat Statistik
9.	BRI	State-Owned Bank in Indonesia, First bank in Indonesia	Bank Rakyat Indonesia
10.	BUMD	Regional-owned business enterprise managed by region that has full authority to the wealth and business	Badan Usaha Milik Daerah
11.	DGAI	Directorate General of Agricultural Infrastructure	Direktorat Jenderal Sarana dan Prasarana Pertanian
12.	DGLAH	Directorate General of Livestock and Animal Health	Direktorat Jenderal Peternakan dan Kesehatan Hewan
13.	Dir Bibit	Directorate of Breeding	Direktorat Perbibitan
14.	Distan	Agricultural Agency that provide services in agriculture	Dinas Pertanian
15.	Dit Pakan	Directorate of Feed	Direktorat Pakan
16.	IAARD	Indonesian Agency for Agricultural Research and Development	Badan Penelitian dan Pengembangan Pertanian
17.	ICARD	Indonesian Centre for Animal Research and Development	Pusat Penelitian dan Pengembangan Peternakan
18.	Kementerian Perikanan	Ministry of Fisheries and Marine Affairs	Kementerian Perikanan dan Kelautan
19.	KKUKM	Ministry of Cooperation and Small and Medium Enterprises	Kementerian Koperasi dan Usaha Kecil dan Menengah
20.	KUD	Village cooperatives	Koperasi Unit Desa
21.	LSA	Livestock Services Agency that provide services in livestock	Dinas Peternakan (dan Kesehatan Hewan)
22.	Menko	Coordinating Ministry on Economics Affairs	Kementerian Koordinator Bidang Perekonomian Indonesia
23.	MoA	Ministry of Agriculture	Kementerian Pertanian
24.	MoF	Ministry of Finance	Kementerian Keuangan
B	**Program**		
25.	Bimas program	Program to increase agricultural production to support rice self sufficiency	Bimbingan massal
26.	BLM	Community grants from	Bantuan Langsung Masyarakat

		government	
27.	KKP	Food Security Credit	Kredit Ketahanan Pangan
28.	KKPE	Food Security and Energy Credit	Kredit Ketahanan Pangan dan Energy
29.	KUPEDES	Rural Business Credit	Kredit Usaha Pedesaan
30.	KUPS	Cattle Breeding Business Credit	Kredit Usaha Pembibitan Sapi
31.	KUR	Business Credit	Kredit Usaha Rakyat
32.	KUT	Farm Credit Program	Kredit Usaha Tani
33.	PMI	Credit for the improvement of quality and intensification of cattle	Peningkatan Mutu Intensifikasi
34.	PUAP	Rural Agribusiness Development	Pengembangan Usaha Agribisnis Pedesaan
35.	SMD	Bachelor Village Building program	Sarjana Membangun Desa
36.	SP3	Skim Agricultural Financing Services	Skim Pelayanan Pembiayaan Pertanian
37.	SPR	Public Livestock Centre	Sentra Peternakan Rakyat
38.	UMKM	Micro-small-medium enterprises	Usaha Mikro, Kecil dan Menengah

CHAPTER 1 INTRODUCTION

1.1. Background to the Problem

Cattle play an important role in rural livelihoods in much of Indonesia. Cattle are an important source of income particularly for farmers with small landholdings where they may contribute 22-26% of total family income (Winarso et al. 2005; Hartono & Rohaeni 2014), or for larger scale production where the potential may reach 33% of total family income (Zulfikri et al. 2014). Around five million farmers (or 39% of livestock farmers) raise cattle in Indonesia, of which, 38% are in East Java (Badan Pusat Statistik 2013). Profits from cattle production provide for a range of household needs, including primary expenses (such as farm inputs), and assist with school fees, health costs, motorcycle purchase and running cost, asset acquisition (houses/land) or to pay for a wedding or religious ceremony (Hadi et al. 2002; Padjung & Natsir 2005; Mahendri et al. 2010; Kalangi et al. 2014).

Cattle production is an important food resource and expansion of production is a challenge in Indonesia. Current herd size is only half the total cattle needed to satisfy Indonesian beef consumption, which is about 2.4 kg/capita/year (Kementerian Pertanian 2016). In addition, in 2000, the Indonesian Government established the Beef-Self Sufficiency Program to support food sovereignty and farmers' welfare, with the aim of increasing cattle production in Indonesia.

While cattle are an important activity for many rural households in Indonesia, the small-holder can generally be described as “traditional” and “un-commercial”. On smallholdings, cattle are often a secondary activity, with little importance placed on profit maximisation and returns (Adinata et al. 2012). This perception of low economic importance is reflected in productivity indicators including long calving intervals, high calf mortality rates, and low growth rates especially in East Java (Lisson et al. 2010; Cahyadi et al. 2012; Sodiq & Budiono 2012; Kalangi et al. 2014).

A range of measures have been introduced to develop small-holder cattle production in Indonesia. Many agencies and projects have sought to increase farm productivity through improved nutrition and management to improve reproduction in breeding herds and increase growth rates in fattening stages (Subandriyo et al. 1999; Soeharsono et al. 2012; Mayberry 2014; Ratnawati et al. 2016). The Government has also sought to stimulate the sector through a range of measures including cattle distribution, the formation of farmers’ groups, services (extension, animal health, breeding), supportive policies (e.g. slaughter bans on productive cattle), infrastructure (cattle markets, ports,

slaughterhouses) and through concessional finance (Waldron et al. 2013), which is of particular interest in this thesis.

A critical strategy to increase productivity and returns from cattle is through household and industry specialisation. Specialised cattle producers can increase scale of production and gain access to markets as well as undertake improved management and achieve better technical levels (Waldron 2008). This thesis is particularly concerned with one form of specialised cattle production, cattle fattening. This is distinct from breeding (cow-calf operations (CCO)) or from mixed CCO and growing operations, which predominate in the small-holder component of the Indonesian cattle industry.

To be viable, cattle fattening requires that small-holders have good technical skills and management. Specialised small-holders usually source inputs such as cattle, feed, veterinary services, and capital externally, require adequate infrastructure (pens, water) and are closely integrated into cattle markets (for the purchase and sale of cattle).

The fattening sector is an important element in the commercialisation of the Indonesian cattle industry. Specialised fattening can increase efficiency in growth periods, reduce turnoff age and increase beef and protein supply to the market and consumers. Fattening as a commercial activity can generate cash income for rural and land-poor households (Waldron et al. 2013). It may stimulate demand and can increase prices for feeder cattle.

The relationships between cattle fattening and other cattle production sectors in Indonesia is shown in Figure 1-1, where successful fattening businesses will be important to trigger the development of cow-calf operations due to demand for feeder cattle.

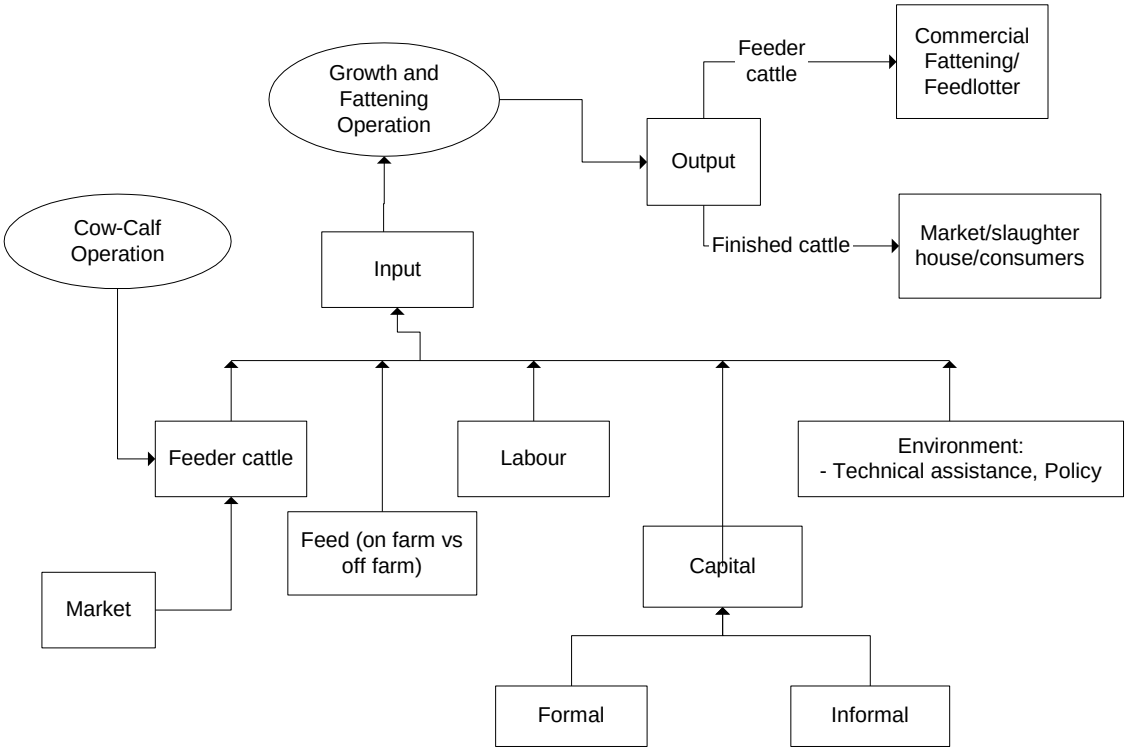


Figure 1-1. Cattle production systems in Indonesia

There are various cattle fattening methods used in Indonesia including small-holders in mixed cattle fattening-CCO and specialised fattening, as well as large corporate enterprises. This thesis will focus on specialised cattle fattening households, which may hold 1 – 20 cattle for periods between five months and one year. These producers are of interest as they are the focus of rural development objectives and government financial policies. While corporate feedlots are the dominant form of cattle fattening in parts of Sumatra (with plantation systems), fattening households dominate in East Java (and the provinces of West Nusa Tenggara and East Nusa Tenggara). In these areas, household cattle fattening can be competitive with corporatised feedlots (Priyanti et al. 2012b) if they have access to market and make efficient use of inputs including feed, labour, and capital.

Fattening households must, however, face a number of challenges to be viable. Of most interest in this study is the fact that cattle fattening requires large monetary outlays for inputs especially for feeder cattle, feed, veterinary costs, and infrastructure (Figure 1-1). The prices of feeder cattle and feed (concentrate) fluctuate and are relatively expensive, particularly for farmers with limited capital or feed resources. Due to the high input costs and investment required, access to finance is a major constraint on the development of the cattle fattening sector including in East and Central Java (Adinata et al. 2012; Priyanti et al. 2012b).

1.2. Research Problem

This study focuses on the role of finance in the development of the household cattle fattening sector in Indonesia, as it arguably represents the largest constraint on sector growth. Providing access to credit is expected to support the development of the cattle fattening sector, and the broader Indonesian cattle industry. East Java Province will be the focus region for this study as the development of household cattle fattening which is a frequent activity in the region, should benefit from greater access to formal credit. Financing models from the formal finance market - particularly government programs with subsidised credit - have been confirmed in this study as the dominant source of finance in the study area. Lending by companies under their Corporate Social Responsibility (CSR) program is a secondary source of finance. Only a small number of farmers sought informal finance through a type of share-farming system (Gaduhan) or other informal means. Moreover, only commercial banks (such as State-Owned Banks, the Foreign Exchange Bank, and Regional Development Banks), as well as the Rural Banks were providing finance to the livestock sub-sector to farmers. Finance provided through agribusiness did not feature in this study as none of the finance available to livestock farmers comes from agribusiness actors.

Small-holders appear to have the capacity to access loans to finance their businesses and increase incomes/returns however, only a limited number utilise formal bank finance. It is reported that only 35% of KKPE credit (Food Security and Energy Credit or *Kredit Ketahanan Pangan dan Energy*) was released to farmers from total credit advances of about IDR27.4 trillion during 2012-2015 (Direktorat Pembiayaan Pertanian 2014b). This poses the question; what factors determine the farmer's ability to access credit. Some financial institutions have incentives for households borrowing for cattle fattening and government subsidies are available within some finance programs. With a buoyant cattle market in recent years, cattle could be produced and sold in relatively short defined periods. However, cattle fattening is a disproportionately small part of bank lending and subsidised finance allocations or targets are often not met. Thus, identifying factors that constrain cattle fattening households from accessing available sources of finance is required.

In analysing the factors that constrain or enable finance for cattle fattening, it is important to note that the finance market does not operate in a theoretical environment of demand and supply-side forces. Rather a range of intermediate actors including government agencies, local institutions and research organisations, provide services that link the two. Questions therefore arise about the appropriateness and effectiveness of

these agencies in stimulating access to finance for cattle fattening and it is these issues that are of interest to this work.

The overall conceptual framework of the thesis is shown in Figure 1-2. It has been argued that there is an incentive to develop household cattle fattening through better access to finance. Therefore, this study provides a holistic analysis presented as a set of six objectives aimed at gaining a greater understanding of factors that impact on access to finance for cattle fattening in Indonesia, particularly in East Java.

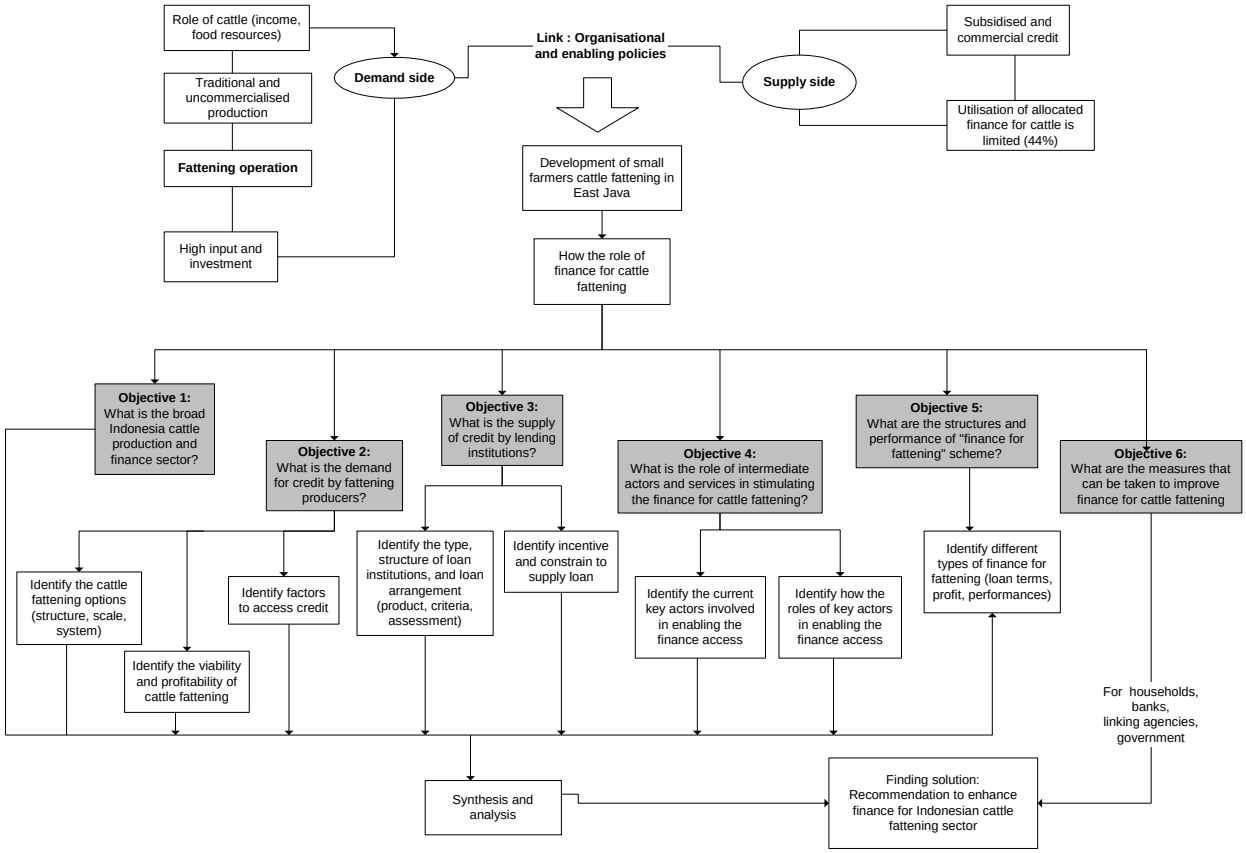


Figure 1-2. Research conceptual framework

1.3. Research Objectives and Research Questions

As suggested previously, the overall aim of this research is to examine the role of finance in the development of household cattle fattening operations in East Java, while the specific objectives are:

1. To understand the broad national environment in which “finance of fattening” takes place in East Java.
2. To assess the factors that determine (constrain or enable) the demand for finance from cattle fattening households in East Java.

3. To identify the factors that determine (constrain or enable) the supply of finance from banks (and other formal financial institutions) in East Java.
4. To identify the major policy and institutional arrangements that constrain or enable the flow of finance between banks and cattle fattening households.

An underlying premise of this thesis is that if the factors that constrain or enable the supply, demand, and linkages between the various players in the financial system can be identified, then these may be addressed to increase flow of finance to households for cattle fattening. If the capital input is used efficiently and fattening households can service their loans, this will stimulate development of the household cattle fattening sector, with flow-on effects for other sectors (e.g. CCO). Additionally, there would be benefits for rural incomes, growth and diversification of bank investment portfolios and the attainment of government policy objectives. Thus, a broader objective of the thesis is:

5. To identify the structures and performance of different types of "finance for fattening" schemes available in East Java.
6. To recommend measures that would improve the flow of finance from banks to cattle fattening households, with measures aimed at banks, households, and intermediate/linking agencies.

In line with the thesis objectives, the broad over-riding question addressed in this thesis is "**What is the role of finance in the development of household cattle fattening operations in East Java?** A series of questions, and more detailed sub-questions arise, and are presented in Table 1-1. The chapters in which these questions are answered are also listed in the table.

Table 1-1. Research questions and sub-questions that are addressed in each chapter

Research question	Sub questions	Chapter
1. What is the broad national environment in which "finance of fattening" takes place across the research sites?	1.1. What are the major structures and trends in the Indonesian beef cattle industry? 1.2. What are the key structures in the Indonesian financial sector, of relevance to bank lending in agriculture, livestock, and cattle fattening?	Chapter 4
2. What are the determinants of demand for finance amongst cattle fattening households in East Java?	2.1. What is the structure, scale and systems related to the cattle fattening sector? 2.2. What are the main factors determining access to credit for cattle fattening households? 2.3. How viable are these household enterprises? What are the determinants of profitability and	Chapter 5

	what is the capacity of households to repay loans? 2.4. Is cattle fattening profitable under commercial interest rate loans?	
3. What are the determinants of the supply of finance from banks for household cattle fattening?	3.1. What are the main channels for finance for cattle fattening (bank, non-bank, formal/informal)? 3.2. What are the financial structures (banks, branches) in Indonesia and how does this affect supply of capital for fattening? 3.3. What are the financial products, lending criteria, and assessment processes of the banks (productivity, competitiveness, risk, serviceability, working with groups to reduce transaction costs, collateral, guarantors etc.)? 3.4. What are the incentives and main constraints for lending institutions to increase the availability of loans especially for cattle fattening?	Chapter 6
4. What is the role of intermediate actors and services in facilitating the viable flow of credit from banks to cattle fattening households?	4.1. Who are the key intermediate actors (government, research agencies, agribusiness, local groups) that link the lending institutions with cattle fattening households across the research sites? 4.2. What are their roles in facilitating finance for cattle fattening?	Chapter 7
5. What are the structures and performance of different types of “finance for cattle fattening” schemes?	5.1. What typology can be used to compare and assess different types of schemes? 5.2. What loan assessment processes and linkages do different organisations use? 5.3. What is the profitability of these schemes? 5.4. How do the different schemes perform against relevant criteria (sustainability, access, alignment with program objectives, risks, profitability)?	Chapter 8
6. What measures/ recommendations can improve the performance of different financial options for cattle fattening?	6.1. What measures can be targeted at households (e.g. assistance in doing budgets, loan applications etc.)? 6.2. What measures would be useful for banks (e.g. loan terms and arrangements)? 6.3. What measures can be used to integrate linking agencies? 6.4. What Government policy is needed to improve the availability of finance for cattle fattening to small-holders?	Chapter 9

This applied study uses comparative case studies to understand both the successful and unsuccessful factors in financing cattle fattening with an understanding of possible linkages to key actors, and as a result develop measures to enhance the role of finance in the development of household cattle fattening operations in East Java. The study will

utilise both qualitative and quantitative data gathered from surveys, interviews, reports or other secondary data and will employ concurrent triangulation to validate those data.

1.4. Contribution of the Study

This thesis reports an applied study that aims to improve knowledge about an under-researched but important sector of the Indonesian economy. It will provide recommendations that can inform policy and the design of finance schemes for cattle fattening in Indonesia and may have relevance for other developing countries.

Contribution to knowledge. The thesis contributes a better understanding of development paths for the Indonesian beef cattle industry. There are numerous studies that address the improvement in cattle production, however most focus on technical and management aspects (deRosari et al. 2014; Affandhy et al. 2016; Sodiq & Yuwono 2016). Less research has focused on financial aspects of the cattle industry, and those that do are mostly focused on the demand side (Sugiarto 2011; Dahri et al. 2015) or linking services (Tawaf et al. 2011). This research has taken a more holistic approach, analysing both the demand and supply sides of the credit market, as well as considering the role of linking agencies and services. This holistic approach is required to account for all the factors that might constrain or enhance the availability of finance for fattening cattle in Indonesia. The analysis of the role of linking institutions and mediating policies will provide support for the recommendations derived from this work.

Recommendations for policy and the design of schemes. These recommendations may increase the provision and uptake of finance by the cattle fattening sector. More specifically, the research will identify the constraints, incentives, and opportunities that would increase the supply of and demand for finance. If these issues are addressed within policy guidelines, the likely result will be:

a) More integration of farmers into finance markets;
b) Further commercialisation and growth of the cattle fattening sector;
c) Increased supply of cattle to the processing industry; and
d) A significant additional contribution to national beef output.

As a consequence, higher incomes for households fattening cattle with flow-on effects for cow-calf producers, would stimulate the growth and diversification of the cattle industry with positive benefits for the banks' investment portfolios.

1.5. Structure of Thesis

The thesis consists of four parts consisting of preliminary chapters, body chapters, chapters in which the comparative case studies are discussed, and results.

The first four chapters are preliminary chapters. **Chapter 1** introduces the research problem and poses a series of research questions that will be answered throughout the thesis. The chapter concludes with comments on the contribution of the study to a better understanding of the cattle fattening sector of the beef industry in East Java.

Chapter 2 reviews literature relevant to agricultural finance. This includes the structures used to provide agricultural finance from both formal and informal sources. Important principles that affect the availability of agricultural finance (including transaction costs, asymmetric information, and risk) are discussed. The chapter concludes by outlining features of some successful and unsuccessful agricultural credit schemes.

Following this discussion on agriculture finance, **Chapter 3** outlines the analytical methods applied in the study. The review will highlight how quantitative and qualitative data have been gathered from surveys, interviews, and secondary sources and will be applied to inform the work. Importantly, comparative case study methods are used to describe a number of different schemes of “finance for fattening cattle” as well as the section of the industry located in East Java. Subsequently, the characteristics of these financing schemes were evaluated against a set of relevant criteria which led to conclusions and recommendations on the best schemes and enabling policies to be implemented in Indonesia.

Finally, **Chapter 4** provides context for the study, examining structures, trends and policies affecting the Indonesian beef cattle industry, including those that impact on the household fattening sector in East Java. The chapter also examines the Indonesian finance sector and reviews specific agricultural finance schemes and bank products available to beef cattle producers.

The body of the thesis is included in chapters that link the demand for and supply of credit, commencing with **Chapter 5,** which examines the demand for finance from cattle producing households in East Java Province. It examines the agricultural and resource systems and the evolution of the household cattle fattening sector in the study areas. It provides a detailed typology and description of different types of households, including budgetary analysis, and an exploration of how finance is utilised. Survey results are presented to reveal factors that determine access to bank finance.

From the supply side, **Chapter 6** examines the incentives and risks for banks lending within the sector. Interviews reveal sources of bank loans, and loan products,

assessment criteria, uptake and repayment terms. This discussion highlights terms and conditions required to access bank finance.

Similar to the previous two chapters, **Chapter 7** examines the institutional arrangements that link demand (by households) and supply (from banks) sides of the "finance for fattening" market. The discussion of institutional arrangements includes a review of the characteristics of the organisations or actors involved, the roles of these parties, and an overview of how the systems work. Fieldwork revealed five types of intermediary/facilitating actors including government agencies, research institutions, agribusiness, farmers' groups or cooperatives, and companies involved in social responsibility programs. These actors are identified and their roles in facilitating the flow of finance for fattening are examined.

Comparative cases studies are presented in the next two chapters. **Chapter 8** reviews six schemes of financing cattle fattening in the research areas that were differentiated on the basis of targeted households, finance providers, and by the range of different structures and facilitating actors. This is done through a detailed description of loan processes and linkages for each scheme, followed by detailed budget analysis. The schemes are assessed against a set of criteria (sustainability, access, alignment with program objectives, risks, profitability, delay in approving loans, and the beneficiaries of the loan).

Chapter 9 follows with an assessment of the value and efficacy of each scheme. The chapter includes recommendations on how to improve finance for fattening schemes and provides the detailed and substantive conclusions and recommendations of the thesis.

The work concludes with **Chapter 10** which provides a critical response to the research questions raised in the study and the implications for policy are highlighted. Finally, discussion turns to the recommendation for further studies.

1.6. Research Scope

While the research takes a comprehensive and holistic approach to this particular research topic (finance for small scale cattle fattening in East Java), by necessity it has clearly-defined boundaries.

First, the research does not analyse finance for other aspects of cattle production, including cow-calf operation. Because of long production cycles, very little formal finance is available to that sector of the industry. The research also refrains from reviewing finance for larger corporatised feedlots because of the focus on rural development. This is

consistent with Government policy which focusses on the providing finance for cattle fattening households and further enhances the value of the study.

Assumptions were made regarding the determinants of profitability of household cattle fattening that impact on their ability to take out and repay loans. These include resource endowments, productivity (especially nutrition), and market settings. While these factors are incorporated into the analysis (especially in the budgeting), the focus is on financial aspects of the system, at farm, bank, and institutional levels.

Finance for household cattle fattening can be derived from various sources, including informal loans from within the community or from agribusiness. The choice to focus on formally sourced finance, especially bank loans, was made as informal finance has more commonly funded crop production and this study has confirmed that formal finance is by far the largest source of finance for cattle fattening households.

This research was limited to East Java, in particular the districts of Tuban and Lamongan. East Java was chosen as it is the largest cattle producing province in Indonesia, with a relatively commercialised household cattle sector, including feed trading and fattening. Cattle production is integrated with intensive cropping systems. Moreover, the agribusiness linkages between small-holders and commercial feedlots are already in place in East Java.

CHAPTER 2 LITERATURE REVIEW

This chapter reviews theoretical and empirical studies related to the rural credit market in developing countries, particularly in relation to the financing of cattle fattening. The review contains six sections, commencing with an outline of farm economics (Section 2.1), which provides background on household incentives, including how to borrow capital. This is followed by a discussion of the role of capital in farm and rural development (Section 2.2), the basic structures of the agricultural finance sector (Section 2.3), and an overview of the principles of agricultural finance (Section 2.4). The review then turns to policy mechanisms that are used in agricultural finance (Section 2.5) and concludes with finance schemes that have been applied in other countries (Section 2.6).

2.1. Principles of Farm Economics

When farmers decide to establish a business, for example cattle fattening, an understanding of the principles, tools and techniques of economic analysis is desirable, especially the calculation of profit. Profit maximization is a key factor in farmers' decision making and is used to allocate inputs optimally to produce output. Agricultural production is commonly defined as "the process of using resources to make goods, provide services or to do both" (Makeham & Malcolm 1986, p. 25). Farmers choose which product can be developed using the resources they have at their disposal.

In all economic activities, there are three classes of inputs namely labour, raw materials (such as land), and capital. Makeham and Malcolm (1986) indicate that land is a fixed input "because once the crop is planted the farmer cannot, in the short term, change the amount of land being used. The land is used, regardless of whether a large or small yield is harvested. Other productive resource inputs such as labour, fertilizer, or seed can be used in the production process in varying amounts. They are called "variable inputs" (Makeham & Malcolm 1986, p. 26). Output is the result of a production process, such as the amount of crop harvested (Makeham & Malcolm 1986). In cattle fattening, the output is the finished cattle and manure which also can generate income.

The output produced depends on the combination of inputs used, particularly variable inputs. The use of additional inputs usually results in an increase in output or extra product but may not be linear. For example, cattle that feed on the same diet will grow at different rates over different fattening periods. The farmers can rationally continue to add inputs until the cost of an additional unit of input equals the value of additional output, in production economics called the "law of diminishing marginal returns". In some cases, if

the farmers increase the level of inputs, the amount of extra product may decrease and this situation in production is consistent with this law (Makeham & Malcolm 1986).

Inputs are of course subject to cost that limits their availability and decision makers must consider how to use limited inputs to meet objectives. The substitution of one input for another in production is common, however in cattle fattening, it is the impact of growth rates on cost that determines profit. The use of pure grain feed in cattle fattening may be costly as it is not totally digested in the rumen. Energy and protein are required therefore a combination of grain and roughage lowers costs and leads to higher profit.

Generally, in agricultural production, total cost consists of fixed and variable costs. Fixed or overhead costs pay for fixed inputs regardless of production volume such as rent of land, cattle pens, or electricity. These costs do not change frequently however, the facilities that generate overhead costs have a limited life and is reflected as loss in value or depreciation. In contrast, variable costs depend on the quantity of inputs used, such as feed or veterinary products; thus, the greater the number of cattle, the more inputs are required, and these are considered variable costs and are generally used in a single production period (Makeham & Malcolm 1986).

Other costs that need to be considered are finance and opportunity costs. Makeham and Malcolm (1986) indicate that financial costs reflect interest rates and loan insurance; while “Opportunity cost is the revenue which could have been earned but is given up when a decision is made to use resources in an alternative way” (Makeham & Malcolm 1986, p. 39). The opportunity cost of money used for agriculture might be the returns from investing in another activity, such as investment. Individuals tend to seek investments that maximise profits, hence understanding costs is necessary to measure business success.

Makeham and Malcolm (1986) state farm income originates from four main sources: 1) from farming operations such as sales of finished cattle; 2) household income from non-farming activities; 3) selling capital and machinery (less common); and 4) money obtained through credit. The implication is that if returns from other activities are better than cattle, households would seek to maximise benefits.

2.2. The Role of Capital in Rural Development

To understand the potential role of finance in the development of household cattle fattening operations in East Java, reflection on experience in other regions may be helpful. It is considered that capital has several important roles in rural development. Firstly, capital is a factor of production, used to purchase production inputs such as seed, fertilizers, and labour to generate higher output and more income (Norton et al. 2010). Capital is also

necessary to finance long-term infrastructure needed for production such as land, cattle pens, machines or other equipment. Capital also helps to grow capacity through the adoption of technology, higher quality inputs or tools (Hermawan & Andrianyta 2012), which can lead to improved economic efficiency.

Capital can be sourced either as internal capital or from external markets. Generally, in Indonesia, almost 90% of farmers use their own capital to fund production (Syukur (2009) cited in Hermawan and Andrianyta (2012)). Low-income farmers rely predominantly on internal capital due to their smaller farms, the use of lower quality inputs and less use of technology (Mellor 1966). However, limited internal capital (or savings) can constrain productivity and output which is when external capital in the form of loans or credit is required. In this case, a loan can substitute for savings to enable capital purchases to be made (Norton et al. 2010).

2.3. Components of Agricultural Finance

This section overviews the structure of the finance sector which services agriculture commencing with the types of financial services available and followed by discussion of the nature of the financial market. This will allow a greater understanding of decision-making, loan appraisal, and terms used by banks when establishing loans or credit for the farming sector. A sound understanding of financial services is critical to the study as credit from the formal market is required to support farmers' cattle businesses in the research area.

2.3.1. Credit and Saving

There are three components to financial services available to farmers, namely savings, credit, and insurance, each are related and important to all businesses including agriculture. Robinson (1998) indicates that financial services help poor people to improve their productivity, obtain higher profits, reduce risk, and enhance their quality of life. Savings and credit can be used to purchase inputs such as seed, stocks of feed, or calves. According to Ellis (1992), credit is different to capital but can be used as capital to purchase items that cannot otherwise be purchased and in that case credit functions as working capital. On the other hand, insurance allows a business to manage risk by transferring part of the operational risks to another party. Livestock insurance, for example, is necessary for farmers who do not have sufficient collateral for a loan and with livestock insurance banks may be more willing to lend.

Credit is defined as “a device for facilitating the temporary transfer of purchasing power from one individual or organisation to another” (Mellor 1966, p. 314). The function of credit as a facilitator in this transfer process can lead to greater efficiency in production. Moreover, credit can be used as a tool to sustain investment (Petrick 2004) where the investors get the future benefits from that credit.

The flexibility in the use of credit is due to its characteristic of “fungibility”. When farmers use credit to buy production inputs, they can change the use of money for consumption, by spending more of their own cash on consumption goods. If credit is regarded as a form of goods like seed, or cattle, the farmer can easily transfer this kind of credit to cash in order to buy food or other consumption items. This latter characteristic of credit is called “diversion and substitution” (Ellis 1992).

There are some success stories related to implementing credit schemes for livestock in other countries. Silva and Sandika (2012) found that the application of credit and farmer training in the dairy sector in the southern region of Sri Lanka could considerably increase income of dairy farmers. Another study by Abedullah et al. (2009) reported that the availability of credit to farmers in Pakistan contributed to increasing the number of lactating animals by more than 50%, which resulted in an improvement in total income of the farmers by more than one hundred percent.

Saving is defined as an excess of liquidity which is kept for future use (Robinson 1998). The rate of saving and investment in agriculture is often limited by low rates of return in agriculture due to unpredictable weather, fluctuating input or output prices, and slow innovation and adoption of technology (Mellor 1966). Commonly in rural areas, savings are often held in the form of harvested product such as paddy that is kept for future use as seed or for consumption. Cattle are also regarded as a way of saving in rural areas. The need for savings as well as credit in traditional agriculture is important to deal with the production and consumption needs (Mellor 1966).

The access to financial services creates opportunities in the development of agricultural output. Producers who have a negative income or lose their asset base cannot continue their activities if they do not have access to loans or insurance (Diagne & Zeller 2001). Adequate access to those financial services provides opportunities for them to finance the inputs to make a profit or invest in more attractive and profitable businesses as well as having sufficient ability to manage their consumption (Zellera et al. 1998).

2.3.2. Formal and Informal Finance

Finance can be categorized as formal or informal (Ellis 1992; Upton 1996; Norton et al. 2010). Institutions that provide formal finance, provide program and non-program credit while informal credit generally comes from neighbours, family, or independent institutions which are not regulated or audited by the government. The informal market is generally based on the relationship between people who have the same needs such as farmers with input or output traders. This lending source is closer to the farmers than formal sources, but the cost of credit is usually higher than if borrowing from formal sources (Nurmanaf 2007). Both formal and informal credit have important roles particularly in rural areas but also present challenges. Figure 2-1 presents the various lending sources in the general rural credit market.

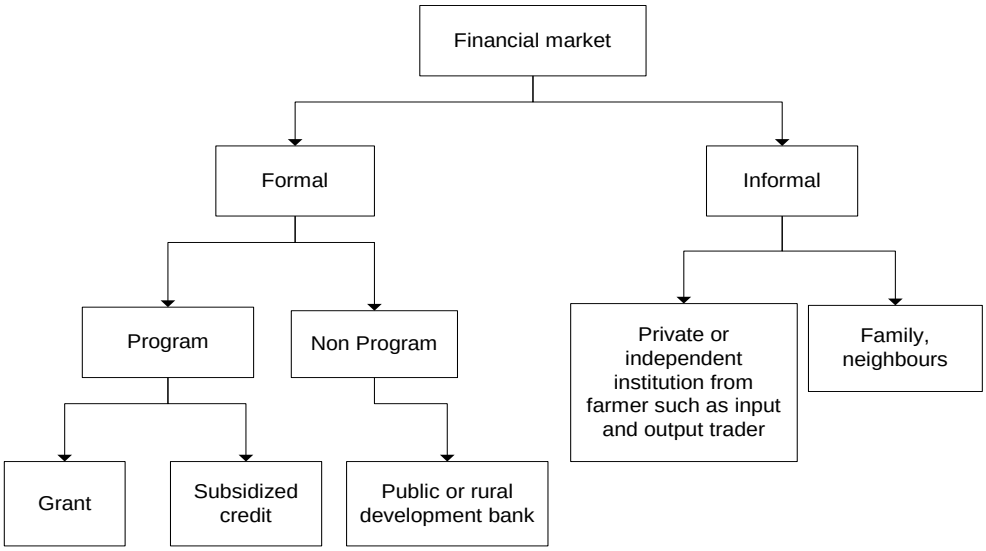


Figure 2-1. The structure of financial market for agriculture

Formal credit is sourced from formal institutions such as government agencies, and public or private banks which are monitored and regulated by government. These formal institutions offer program credit which comes mostly from government as grants or subsidised project funds aimed to assist farmers and distribute non-program credit which commonly comes from banks, cooperatives, or credit societies. The principal difference between these types of formal credit is based on their sustainability. Program credit from the government is highly dependent on the government budget, policy, and priorities, and can be a politicised process. Non-program credit from commercial banks are likely to be more sustainable being funded by deposits.

Historically, there is evidence that 70% of loans in rural India were sourced from informal finance both professional and agricultural moneylenders (Mellor 1966). This has also been reported in West Nusa Tenggara, Central Java, and South Sulawesi, Indonesia.

However, a different result is reported by Saleem (2011) that formal credit such as that available from commercial sources, like Zari Taraqiati Bank or Industries-Sugar Mills in Dera Ismail Khan, Pakistan, was more popular than informal credit.

The farmers have easy access to informal credit due to simple lending procedures and lenient collateral requirements. New borrowers only need references from other people as a guarantor. The moneylender needs to know the community well to identify worthy borrowers. They can also administer the loan easily if the information about borrowers is well-known and provide the necessary supervision of these loans. However, sometimes in informal lending, the lender tends to tie-up or obligate the borrower in some way. The detailed differences between formal and informal credit are shown in Table 2-1.

Table 2-1. Characteristics of formal and informal credit

No	Indicators	Formal Credit	Informal Credit
1.	Type of loans	Prefer production loans	Provide production and consumption loans
2.	The sustainability of loan	Regular repayments and sometimes subsidised by the Government	No regular repayment schedule depends on situation and is not subsidised
3.	Requirement to apply	Farmers need to have a history of saving, a substantial income, viable business	Ignores farmer's status
4.	Procedure to obtain	Complex administration to ensure safety of loans, requiring written documentation	Mostly a simple lending procedure, may not need written documentation
5.	Loan distribution	Restricted to business hours, farmers may also need to wait for approval which can take time	Operate anytime with minimum approval delays, rejection rate is low, but risk is reflected in interest rate
6.	Size of loan	Selective to amount of money required by farmers	Can approve any amount of loan or credit
7.	Collateral	Collateral is required to secure the loan, including deposits or savings account with the bank	Collateral is still required to secure the loan as the lender will take the assets if the loan is not repaid
8.	Interest rate	Low	High
9.	Transaction cost	High	Low
10.	Information	Institution only has limited knowledge of the borrower based on documentation	Lender knows the borrower well through personal contact
11.	Social ties	No social ties, lender unfamiliar with the borrower; difficult to monitor the loan	Close relationship with borrower; easier to monitor activity
12.	Access of new technology	Can collaborate with Government to encourage the introduction of new technology	Local activity, so the lender may not be aware of new technology

Source: Ellis (1992); Upton (1996); Norton et al. (2010)

2.4. Principles of Agricultural Finance

The high incidence of informal credit for farmers arises because formal lending institutions perceive farm lending as costly and high risk. Christen et al. (1995) reported a lack of access to formal credit, or savings, by more than 80% of the population in the world. Banks have little incentive to make small loans and offer deposit services to farmers when there is a large demand for financial services. In addition, poor rural farmers often lack the capacity to pay interest rates charged by lenders, so it is unviable for institutional lenders to operate in rural areas.

The characteristics of credit markets in developing countries are different from developed countries. Besley (1998) identified three principal features of credit markets in developing countries which distinguish them from credit markets in developed countries. Firstly, there is a lack of collateral because many people in rural areas do not have titles to land or have limited assets that can be used as security as also reported by other studies (Rozali 2007; Abula et al. 2013). However, it is suggested that considering the amount of savings, the proportion of previous loans repaid, as well as belonging to an established farmers' group, can be regarded as collateral as reported from six states in South Western Nigeria by Oluwasola and Alimi (2008).

Secondly, credit markets in developing countries are “underdeveloped complimentary institutions” which is characterised by illiteracy issues, with poor communication between parties, and income uncertainty. Lack of education leads to low ability in credit application processes (Sugiarto 2011), while poor communication exacerbates the cost in credit arrangements (Besley 1998). Moreover, farmers can not ensure their income due to lack of business plans and production uncertainty which makes it difficult for the bank to trust the farmers when they want to borrow money. Therefore, cash-flow analysis is an important factor in estimating income achieved by farmers (Rozali 2007). The annual income of a household is a significant factor in determining the capacity of farmers to repay loans. For instance, farmers in Nigeria who reached 90% of the required repayments level, could access another loan (Abula et al. 2013).

Another characteristic of the rural credit market is “covariant risk and a segmented credit market” (Besley 1998, p. 375) where only one group of borrowers, or farmers in one area, are the focus so that loan portfolios are not sufficiently diversified. For example, bank loans made only to the agriculture sector which has a high risk of income fluctuation, could destabilise the financial institution. If the fluctuation in income happens to many farmers at the same time and those with savings withdraw their money from the banks (covariant risk), this will exacerbate operation of the credit market in rural areas.

The next section describes several factors that determine the incentives for lending institutions to provide financial services, especially credit for agriculture. These include transaction costs, imperfect information between lenders and borrowers, and risks associated with profitable farm operations. These principles are considered in the development of “finance for fattening” schemes in Indonesia, for example in forming groups or developing contracts with agribusiness.

2.4.1. Transaction Costs

There is a cost to be met by lenders when supplying credit to borrowers, known as transaction costs, and this is part of the cost covered by the interest rate offered to borrowers. Transaction costs include administration (such as the cost of time to meet borrowers, to monitor and evaluate loans and collect interest) as well as bookkeeping costs (to record and document loans). Transaction costs are an important factor to consider when providing financial services and assessing loans made to borrowers.

Transaction costs are different between sources of credit. Commonly, the transaction costs associated with formal credit are higher than for informal credit, particularly in rural areas. The reason is that rural households usually apply for small loans, while banks prefer to make large loans to large businesses due to the relatively high administrative costs for small loans (Mellor 1966; Furubotn & Richter 2005). In addition, all transactions by formal institutions are recorded as documents creating an associated bookkeeping cost (Norton et al. 2010).

Moreover, imperfect information may exacerbate the transaction costs. Formal lenders often do not have sufficient information about their borrowers, their activities, or an understanding of the likelihood of default, therefore, the lender charges a high interest rate to cover the risk (Budastra 2003). Transaction costs incurred because of imperfect information will be higher if farmers live far from the lending institution (Rozali 2007; Etonihu et al. 2013).

In comparison, informal credit incurs low transaction costs because record keeping, and documentation are minimal. Informal money lenders also usually live near and have existing relationships with lenders on which to base lending decisions. Budastra (2003) suggests that if the lender knows their borrowers well, including their activities and the ability to repay the loan, failure to pay will occur infrequently and the lenders do not need to charge a risk premium. However, even though transaction costs for informal lenders are lower than with formal lenders, they still charge farmers a high interest rate.

Reduced transaction costs are likely to be important when supplying financial services to rural households. Budastra (2003) claims that it is the high transaction costs that discourage lending institutions from providing financial services to farmers. Norton et al. (2010), suggests limiting supervision by the lending institution may reduce costs, however this may increase the default rate. It is also argued that computerised systems and simple institutional structures may also lead to reduced fixed costs (Pischke 1991; Hoff et al. 1993). The increasing interest rates may also cover transaction costs, but this tends to increase "moral hazard" and "adverse selection" as low risk borrowers are screened out and the likelihood of poor borrowers getting credit is increased.

2.4.2. Imperfect Information

The standard model of perfect competition occurs when lenders and borrowers know each other and conduct transactions with few transaction costs, however the credit market is hampered by imperfect information. Lenders are unwilling to provide loans to borrowers if they have little information about those borrowers. Besley (1998) examined two major information problems in credit markets, adverse selection and moral hazard.

Adverse selection occurs when one person has more information about the risk of a transaction than the other party, for example when lenders have more information than borrowers about their activities (Jafee & Russell 1976; Stiglitz & Weiss 1981). Adverse selection therefore leads to an inefficient credit market; where banks try to find alternative ways to decrease information asymmetry through setting a high interest rate which is expected to cover the average risk of those activities. Besley (1998) argues that interest rates do not only match supply and demand for loans, but also determine the quality of borrowers. In this case, the increased interest rate is problematic for banks. Rather than attracting creditworthy borrowers, they attract high risk borrowers where the risk of default is higher and will impact on profitability (Stiglitz & Weiss 1981). Moreover, Stiglitz and Weiss (1981) also found that the increased interest rates reduce the motivation for borrowers to repay because they prefer activities which have lower probability of being repaid.

To limit exposure to risky borrowers, banks may also use collateral to screen their borrowers as high-risk borrowers tend to lack sufficient collateral (Stiglitz & Weiss 1986). In Japan, guarantees, collateral, and loan monitoring before initiating the relationship are used to reduce the problems with imperfect information (Corbett 1987). Moreover, banks usually prefer to ration credit instead of increasing interest rates, however this decreases

the supply of credit and investment in the economy (Jafee & Russell 1976; Stiglitz & Weiss 1981).

Moral hazard also occurs when lenders have limited information about borrowers leaving the lender to carry greater risk. Borrowers may change their activities or behave negatively to the detriment of lenders. To deal with this problem, finance institutions or lenders require collateral to apply for a loan. Serra-Garcia (2010) reported that collateral is an effective way to decrease moral hazard when interest rates are low but is not effective with high interest rates because it decreases the demand for credit.

2.4.3. Risk Management

Risk is key obstacle affecting investment, especially in agriculture (Karlan et al. 2012). There are many sources of risk in agriculture which can affect the financial viability of farm activities. Among these risks are those that can be categorised as business and financial risk (Hardaker et al. 1997; Huirne et al. 2000). Business risk includes production risk (such as yield variability), price risks (such as fluctuations in input-output prices), personal risk (such as risk of injury) and institutional risk (such as changing government policies). Financial risk relates to how the farm is financed. Each risk has some correlation with other risks, for example yield performance is influenced by the weather and both input prices and output prices may also be influenced by weather conditions.

Efficient risk management strategies may help to reduce risk exposure. Of particular interest here are the better risk management tools that can be developed through micro-credit networking and infrastructure (Karlan et al. 2012). Risk sharing (Newbery 1989) allows for the sharing or transfer of risk to other parties, for example the owner of livestock could share half of the production risk with their worker for a share of profit. Meuwissen et al. (2001) claims risk-sharing strategies have credibility both theoretically and empirically and summarised types of risk-sharing strategies in agriculture:

1) Share tenancy/share cropping/share leasing, where land rent is paid by a percentage of output. In this case the landowner provides land and the tenant so called “penggarap” (means cultivators) provides the labour. This is common in food crop production in Indonesia;
2) Production contracts in which the contracting firm takes control of the production process, provides access to loans for farmers and certainty of market price. This type of contract is common in poultry businesses;
3) Marketing contracts where price is decided by producers and traders or consumers before harvest and it is not influenced by the fluctuating market price;

4) Insurance that requires a premium paid by farmers to the insurer. Mostly, it is available for life insurance and less often for agriculture (Hardaker et al. 1997).
5) Financial leverage when debt-capital can be used for other investment to gain a higher return.
6) External equity financing when an investor provides money and receives a share of the returns.

Risk management strategies have also been classified into three groups, strategies to reduce, mitigate, and cope with risk (Table 2-2) (Holzmann and Jogersen (2001) cited in OECD (2009)).

Table 2-2. Three groups of strategies to manage risk

Strategies	Farm/household/community	Market	Government
Risk reduction	Technological choice	Training in risk management	- Macroeconomic policies - Disaster prevention - Prevention of animal diseases
Risk mitigation	Diversification in production; Share cropping	- Insurance - Vertical Integration - Production/marketing contracts - Spread sales - Diversified financial investment - Off-farm work	- Tax system income smoothing - Counter-cyclical programs - Border and other measures in the case of contagious disease outbreaks
Risk coping	Borrowing from neighbours/family Intra-community charity	- Selling financial assets - Saving/borrowing from banks - Off-farm income	- Disaster relief - Social assistance - All agricultural support programs

Source: Holzmand and Jogersen (2001) in OECD (2009, p. 22)

Decisions on risk management also depend on farmers' attitudes (whether they are risk takers or risk averse). Moreover, the costs to share risk, the size of the risk, the possibility of new risks, how much income is guaranteed, and the farmer's perceptions of risk are other factors considered in a risk management strategy (Hardaker et al. 1997).

2.5. Rural Credit Policy

The previous section reviewed the structure of the rural finance market, including formal and informal sources of credit; however, the success of the market is influenced by how the credit institutions work. "The entire system of institutions and the way they work is called the rural financial system" (Ellis 1992, p. 154); and the success of the rural financial

system is dependent on the efficiency of the finance sector. In the case of market failure or inefficient allocation of credit, Governments may also intervene (Besley 1998). This section overviews policy and instruments used to support the development and functioning of rural financial markets. Subsidised credit is one such policy option to increase access to credit and will be discussed in the context of the rural financial system. The analysis of rural credit policy, particularly subsidised credit, is relevant to this study as the Indonesian Government has established subsidised credit programs to develop cattle fattening.

2.5.1. Policy Instruments

There have been different targets for credit over time. Between 1950 and 1960, emphasis focused on credit for large commercial farms rather than for poor farmers (Ellis 1992). Credit provided to lower-income farmers was mostly used for consumption, with high risk and transaction costs (Mellor 1966). However, since the mid-1960s, it has been accepted that small farmers with sufficient access to credit could produce greater output using newer technology.

Credit policy is important in rural areas as it provides cash for investment and reduces dependence on informal money lenders (Ellis 1992). Often credit policy aims to provide working capital to small farmers, who may otherwise struggle to borrow successfully from commercial banks. For example, small farmers often have short term cash needs, especially when planting crops, waiting for harvest, or faced with low output prices. These situations are often at odds with commercial long-term bank lending preferences, therefore, the availability of funds through credit policies allows farmers to sustain activities in the short term (Ellis 1992).

Several credit instruments may be used to develop credit policy. Ellis (1992) identified four instruments of credit policy, interest rates, credit targeting, loan portfolio regulations, and miscellaneous instruments.

1. Interest rates are determined through supply and demand for credit in a competitive market. However, government can set a lower interest rate, usually by providing a subsidy, to reduce the cost and increase farmers' demand for credit. As a result, these lower interest rates influence the profit gained by the lending institutions and decreases the sustainability of the financial market.
2. Credit targeting means that credit schemes set criteria for access, which in farming may be based on land area or income.
3. Loan portfolio regulation for lending institutions may include a minimum proportion of lending to be available to agriculture, availability of short term loans, or setting a

maximum loan size. For example, banks in the Philippines were required by the government to provide 25% of loans for farmers at a set interest rate. In India, government control over lending activities requires that banks have to provide 75% of their loan portfolio for agriculture (Besley 1998).

4. There are a range of other related (non-credit) instruments to promote small-holder investment in improving productivity. For instance, when government provides goods such as fertilizer or cattle. The government may also require banks to build branches in rural areas in order to support farm financing even though they may not generate profits from this activity.
5. Finally, Government intervention has proved beneficial in several ways in countries such as India and Mexico when they nationalised their major banks in 1969 and 1982 (Besley 1998).

In the context of Indonesia, government has intervened through credit policy to deal with perceived failure in the credit market. As mentioned previously, market failure in the general credit market is typically generated by asymmetric information (Minelli & Modica 2009) with two other major problems being adverse selection and moral hazard (Besley 1998) and also lack of competition. As in other countries, these are major issues for agriculture in Indonesia, particularly for the cattle fattening sector.

Cattle fattening, like other commodities in the agriculture sector, is a high-risk business with fluctuating availability of feed as a major component of the farmers' costs. This affects returns and the viability of the activity. The banks and financial institutions have access to more information about how risky the cattle business is than the farmers themselves and the possibility of default in repayment. In this situation, the banks set the interest rates high enough to cover the risk from the activity. A high interest rate affects the demand for credit, especially from those farmers who have limited capacity to repay loans at that high interest rate. At the same time, the government also support the development of cattle production in Indonesia. It sought to do that by stimulating the banks to provide finance/loans to cattle fattening households. Therefore, the government set up a subsidy scheme to support these operations. In this program, banks can still offer loans at a commercial rate, but borrowers only need to pay the rate of interest after the subsidy by the government, so the banks still can generate a profit. To support the subsidy policy, government of Indonesia has also targeted the credit system by focussing on small- and micro-businesses because that has a high multiplier effect on employment. Moreover, government also intervenes to the extent of encouraging banks to extend credit for

agriculture, fishery, forestry and processing industries as a priority (Kementerian Koordinator Bidang Perekonomian 2018a).

As well as imperfect information, moral hazard is another problem in this sub-sector. Borrowers might neglect their activity which disadvantages the lending banks or borrowers may refuse to repay their loans. To deal with this problem, banks expect borrowers to offer some sort of collateral as security and an effective way to deal with moral hazard (Serra-Garcia 2010). However, cattle fattening households face the problem of having adequate collateral, which also decreases the demand for credit. Therefore, government intervention has permitted banks to disburse program credit to cattle fattening households on the recommendation from livestock agencies, through farmers' groups, and also defined seasonal repayment options for agriculture as in the KKPE and KUR programs.

In addition, lack of competition is also another condition in which market often fails to get efficient outcomes. Cattle fattening business in Indonesia also face a lower competition in some areas. A lower scale of production leads the business to be less competitive (Rouf et al. 2014); as well as a weak position in the price determination of cattle. Therefore, government provide subsidised credit to support farmers increase their scale of production. Moreover, government also stimulate the growth of "partnership" as a strategy to increase the profit for both parties; as well as support trainings/assistances/technology in keeping cattle.

2.5.2. Subsidised Credit

Subsidised credit is believed to provide opportunities for farmers who may be affected by the failure of the formal money market to provide sufficient credit, especially in developing countries. The Government may intervene by providing low-income farmers with external capital as cash grants or subsidised interest rates loans (Mellor 1966).

The successful experience with subsidised credit represented by Grameen Bank in Bangladesh is reported by Norton et al. (2010). It provides lower-income farmers, most of whom are women, with small amounts of money without collateral. The average interest rate is about 16%: subsidised 5-10%, and the bank provides supervision related to the use of money. Farmers are grouped into associations, normally of five members, and three or four of them are women. Subsidised credit may also allow farmers to save part of their income (Ashari 2009).

However, rural credit subsidies have some negative impacts, one of which is increasing income inequality. The reason for this is that program credit is mostly accessed by large farmers, who get a subsidy or income transfer (Braverman & Guasch 1986).

Moreover, some key studies (Mellor 1966; Ellis 1992; Upton 1996; Norton et al. 2010) also identify other negative impacts of subsidised credit on lending institutions, borrowers, government, and the financial market (Figure 2-2).

Subsidised or low interest rate credit will burden the government budget because the government has to pay a percentage of the interest rate on loans offered by lending institutions or banks. The sustainability of such program credit depends on the government budget (Ashari 2009). If there is no money, these projects will stop.

Subsidised credit also undermines the lending institutions, particularly private banks, which do not get subsidies from government. They have to compete with those that get subsidies by decreasing their interest rate which then may not cover their costs. This could cause banks to fail and consequently they might need additional money from the government to cover their costs. If the government does not have sufficient money, those banks could close and decrease investment in agriculture.

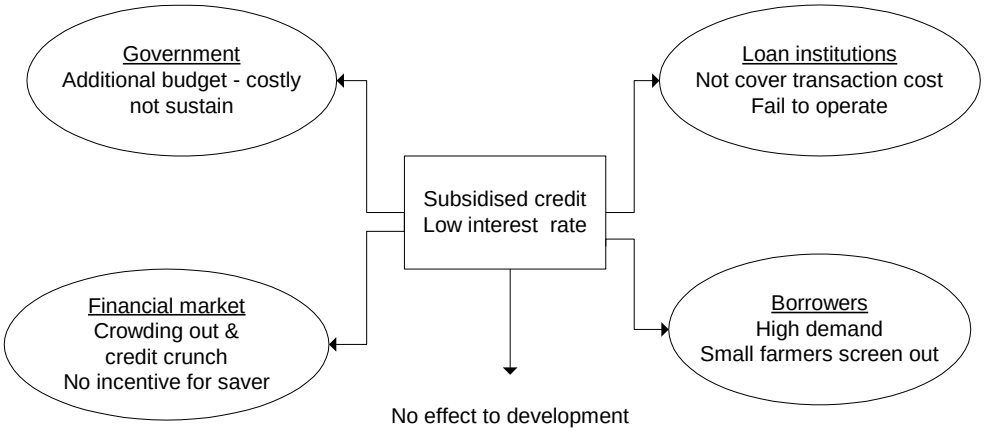


Figure 2-2. Negative impacts of subsidised credit

Lower interest rates can result in excess demand for credit causing lending institutions to ration credit which tends to mean that more credit will go to large farmers (Adam et al. 1984; Gonzales-Vega 1984; Freixas & Rochet 2008).

Subsidised credit also crowds out regular players in financial markets (Ciaian et al. 2012). When farmers get subsidies for their agricultural businesses, this can decrease their demand for finance from loans without subsidies. Moreover, Norton et al. (2010) indicate that subsidised credit decreases all interest rates, and this will discourage saving households from keeping money in the bank. Lower interest rates can create a “credit crunch”, when banks decrease their supply of credit and they become more selective in choosing their borrowers (Pasha 2009).

2.6. Finance Schemes Used in Other Countries

Ideally, the rural financial market should work as any other market in the absence of intervention. In practice, however, markets do not operate perfectly (i.e. under perfect competition) so appropriate government intervention can be warranted and justified. This section will describe the finance schemes that have been developed in other countries or contexts to meet these challenges. Successful and unsuccessful examples may provide lessons relevant to the case of financing household cattle fattening in Indonesia.

2.6.1. Commercial Interest Rate

Schemes with commercial interest rate loans are important to analyse as the viability of household cattle fattening under commercial interest rate loans is a topic included in this study. A low interest rate, as occurs in subsidised credit, causes inefficiency in the financial system for reasons described in Section 2.5.2. Suggestions from some research are that commercial interest rates should be applied. Ellis (1992) introduced the concept of the "self-sustaining credit scheme" where the interest rate on borrowed funds should cover the interest rate paid on savings, average transaction costs, and allow for the risk of default; a margin of about 4-5%, although this could vary over space and time. In order to reduce interest rates, paperless loan applications can be used to reduce transaction costs.

Bank Rakyat Indonesia (BRI), one of largest State-owned banks in Indonesia, is an example of a successful bank providing loans for agriculture at commercial interest rates. BRI started providing loans to agriculture in the 1970s through the BIMAS program (*Bimbingan Massal,* program *for* self-sufficiency in rice) with subsidised interest rates. However, this bank almost went insolvent because the interest rate did not cover transaction costs, and deposits were very low. In 1983, the Government allowed BRI to set their interest rate when they offered rural business credit (*Kredit Usaha Pedesaan* or KUPEDES). The difference in interest rate between deposit and credit associated with high repayment rates, enabled BRI to earn a profit. After two years, this bank reached their break-even point and became profitable in three years after setting commercial interest rates.

There is a common belief that commercial interest rates will be difficult to establish in poor countries. However, Robinson (1998) confirmed that the commercial approach could be adapted in either developed or poor countries such as in Bangladesh where credit is provided by an NGO called The Association for Social Advancement (ASA). Another positive experience was reported by lending institutions in Tanzania who mobilized savings toward commercial microfinance. The possibility of using commercial interest rates

is confirmed by the fact that poor people are able to pay high interest rates to moneylenders. Moreover, commercial interest rates are also paid by other non-agricultural sectors, so it should be possible for the agriculture sector.

Therefore, charging commercial interest rates has the potential to sustain the viability of lending institutions in Indonesia. Robinson (1998) claimed that using a commercial interest rate was necessary to meet the high demand for rural credit. To be successful, the government must support this position by regulation, supervision, educating the public, and recognizing and rectifying earlier mistakes.

2.6.2. Combining of Credit with Other Financial Services

Resolving financial system problems involves mobilization of savings, commercial interest rates, and effective loan recovery (Ellis 1992). Mobilising savings can diminish the dependency on external funds from government or other donor sources and decrease default rates. Farmers are savers as well as borrowers which should decrease the transaction costs for banks to gather information. Besides that, savings, credit, and insurance are interlinked, so efforts to improve one component should impact on the others (Norton et al. 2010).

A case study of Grameen bank provides an example of the successful delivery of multiple services by financial institutions, where in that case, farmers can save their money for a specific time (daily, monthly or seasonal). In this scheme, the amount of credit available is linked to the farmers' savings so it can minimize the default on repayments.

Even though Grameen Bank has successfully lent money to poor people and requires savings by their borrowers, it still depends on a subsidy because they do not mobilize their savings deposits but just put them in a commercial bank and use the interest to finance their costs. If the subsidy is terminated, the sustainability of the bank will be questionable.

Banks in India and China provide savings as well as credit facilities, but this is still not effective because the gap in interest rates between savings and loans is too small (Robinson 1998). So, a combination of tools, such as commercial interest rates and decreased transaction costs, may be needed to deal with financing problems.

2.6.3. Group Lending

Applying for credit as a group is more efficient due to low cost monitoring by peers in the group. This can decrease the number of non-performing loans and if any one borrower cannot make repayments, the group will take responsibility, which reduces the risk of

default (Stiglitz 1990; Upton 1996). For example, groups can stipulate that all payments have to be made before follow-on credit can be obtained, so the group has an incentive to stop late or non-repayments.

Group lending also has a role in improving the situation regarding asymmetric information about borrowers so that transaction costs can be reduced (Huppi & Feder 1990). Joint group liability is important in using local knowledge to select borrowers and using peer pressure to decrease transaction costs and increasing the repayment rate improves efficiency of the whole credit system (Norton et al. 2010). Groups are usually formed with members who know each others character and farming ability. The group will organise loan applications collectively, hold meetings, keep records, monitor each member and enforce repayment schedules particularly if any of the members default, because it will influence the entire loan. This situation reduces transaction costs for the banks. However, there is actually more cost for the group to carry out their activities.

In group lending, other financial services such as savings facilities can also be developed as part of the overall financial activity. Farmers may be encouraged to save and deposit their money as a group which is good for the sustainability of capital which is needed in their businesses as happens in Grameen Bank.

2.6.4. Credit from Agribusiness Actors

The relationship between farmers and traders could be an alternative way to increase financing for agriculture, particularly for cattle. In this case, traders provide small loans to farmers to finance their production which they can repay after selling cattle. This credit arrangement provides a secure market for farmers to sell their production while it also guarantees supply for traders. This relationship has a lower cost of operation for traders because they know their producers well including their farming activities. However, this model is not flexible given that traders can control the marketing operation (Upton 1996). The price of providing credit is usually more beneficial to traders than producers. Therefore, the government may have a role in setting the price so that it benefits both actors.

2.6.5. Supervised Credit Schemes

Supervised credit schemes can introduce new technology to increase productivity and income. The success of supervised credit in Brazil has been reported through a program from the Association for Credit and Rural Assistance (ACAR). This scheme has been successful with low-income farmers as borrowers, by modifying the function of

supervisors, and having the same person who manages the loan also responsible for collecting repayments (Mellor 1966). However, this idea of combining credit management with supervision has several disadvantages such as: 1) More effort is required to concentrate on low-income farmers who have less education, poorer ability to manage risk, or to become early innovators which are more appropriate for medium or large income farmers; 2) Tying supervision with credit approval has a high cost when compared to the value of loans received by low-income farmers; 3) borrowers may feel awkward dealing with a distant supervisor because of the personal information that is related to the loan.

2.7. Implications from This Thesis

This study also includes some budgeting analysis which estimates the profitability of fattening cattle using subsidised and commercial interest rate credit. This type of analysis is also an important consideration by banks when deciding where to invest their money.

Significant issues emphasized in this review of the agricultural credit market such as high transaction costs, imperfect information, and high risks in agriculture (in this case cattle fattening) also exist in the research area. This leads to some difficulties for farmers in accessing the formal credit market. To deal with the capital issue in developing cattle fattening, the Indonesian government has established several credit policies, with one of them being a subsidised credit scheme. In some respects, this may be successful and help farmers access capital to support their businesses. However, some studies indicate that subsidised credit is not the best option to overcome lack of access to formal credit due to its impact on sustainability. To improve the sustainability of cattle fattening, a sustained flow of money from banks at market rates is required.

Some successful finance schemes which have been developed in other countries have been introduced into the study area. For example, the formation of groups in Tuban and Lamongan districts that help farmers with loan applications can reduce transaction costs.

CHAPTER 3 RESEARCH METHODOLOGY

This chapter defines and outlines the approaches applied in this study to gather and analyse data to address the research questions listed in Chapter 1 (Section 1.3). Section 3.1 outlines the research design including an overview of descriptive, explanatory, and prescriptive research. Moreover, as applied research, this study was designed to find ways to improve the availability of finance for cattle fattening in the study area. Case studies and mixed (qualitative and quantitative) methods were adopted including a concurrent triangulation strategy to validate information and balance the potential methodological weaknesses. The next section (Section 3.2.) provides an explanation of methods and tools used in the study including how questions were formulated in order to gather the data to answer the questions posed in this study. This is followed by a discussion of the analysis applied in the study (Section 3.3.) and concludes with a description of the sites where the research was conducted including an explanation of why those sites were chosen (Section 3.4).

3.1. Research Design

This study focuses on the role of finance in the development of small to medium scale cattle fattening operations in East Java and involves descriptive, explanatory, and prescriptive research. The study is an example of applied research where the findings are expected to be used by practitioners (government, business and development agencies) who are involved in agricultural (especially cattle fattening) programs.

This study adopts a comparative case study approach and used mixed methodsincluding quantitative and qualitative procedures. The research design follows the structure developed by (Creswell 2009), which focusses on the research problem, the researcher's experiences, and the target audience which the study will benefit.

3.1.1. Descriptive, Explanatory, and Prescriptive Research

Descriptive studies aim to answer questions about "what is going on?" (Vaus 2001). In this case, the role of finance in international agricultural development, is examined with the intention of extending findings to the cattle fattening systems and finance sectors within a specific region in Indonesia. The explanatory part of the study focuses on the question of "how" the supply of finance relates to demand and how policy and the legal institutions interact to improve the supply of, and demand for, finance for cattle fattening.

After describing the demand and supply for finance and policy in finance for fattening (Chapter 5 and 6), the study explains policy or institutional influence over supply-demand

(Chapter 7), and in turn shows the performance of different types of financing cattle fattening developed in the research area (Chapter 8). The research then takes on a prescriptive approach, developing recommendations to overcome constraints, improve policy settings, and suggesting possible interventions and partnerships to increase finance for cattle fattening (Chapter 9).

3.1.2. Applied Research

The features distinguishing applied research from basic research are purpose, context, and methods (Hedrick et al. 1993). Basic research contributes to the development of universal knowledge of the world around us, where applied research attempts to understand and explain problems and may often address multiple research questions.

In seeking to understand the existing policy and structure of supply and demand for finance, this study takes the form of applied research aimed at ultimately improving the finance sector for cattle fattening in Indonesia. As a result, policy changes or particular financial models can be recommended to help resolve capital problems in cattle production in Indonesia, particularly in fattening operations.

3.1.3. Comparative Case Study Approach

The case study approach is one of several accepted ways to conduct research in social science. “A case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin 2003, p. 13). In a case study, there is no control over the behavior of the event as in experiment where some or all variables can be controlled. A case study approach also provides an appropriate method to examine current events (Yin 2003).

The case study approach is used in this thesis to answer “how and why” questions. It will assist by creating a better understanding of the finance system for cattle fattening in Indonesia by drawing on the inter-related perspectives of key actors (farmers, banks, government, and other related actors). The evidence from these witnesses allows examination of circumstances in real life.

There are two variations of case study research which are single and multiple case studies. The study has adopted a multiple case study approach which examines six different methods for financing cattle fattening in East Java. Justification for choosing six cases include the different sources of money (bank, government, company); the types of farmers (individuals or group); and explores the links to other actors (commercial traders,

companies, beef cattle producers, feed mills, LSA (Livestock Services Agency, *Dinas Peternakan dan Kesehatan Hewan*), research institutions, or other agencies).

There are several ways to gather data in case study research. Yin (2003) discussed six common sources of evidence: documentation, archival records, interviews, direct observations, participant-observation, and physical artifacts (Table 3-1).

Table 3-1. The characteristics of six sources of evidence used in case study research

No	Source of evidence	Strengths	Weaknesses
1.	Documentation	• Stable – can be reviewed repeatedly • Unobtrusive – not created as a result of the case study • Exact – contains exact names, references, and details of an event • Broad coverage – long span of time, many events, and many settings	• Retrievability – can be low • Biased selectivity, if collection is incomplete • Reporting bias – may reflect (unknown) bias of author • Access – may be deliberately blocked
2.	Archival Records	• *[same as above for documentation]* • Precise and quantitative	• *[same as above for documentation]* • Accessibility due to privacy issues
3.	Interviews	• Targeted – focuses directly on case study topic • Insightful-provides perceived causal inferences	• Bias - poorly constructed questions • Response bias • Inaccurate due to poor recall • Reflexivity – interviewee gives what interviewer wants to hear
4.	Direct Observations	• Reality – covers events in real time • Contextual – covers context of event	• Time consuming • Selectivity – unless broad coverage • Reflexivity – event may proceed differently because it is being observed • Cost – hours needed by human observers
5.	Participants Observation	• *[same as above for direct observation]* • Insightful into interpersonal behaviours and motives	• *[same as above for direct observation]* • Bias due to investigator's manipulation of events
6.	Physical Artefacts	• Insightful into cultural features • Insightful into technical operations	• *Selectivity* • *Availability*

Source: Yin (2003, p. 86)

This study utilises interviews which can be guided by open-ended questions where key respondents are asked about their situation and opinions of current events. Alternatively, interviews can be focused which requires structured questions that may include a survey. Evidence from documentation is also important in this study and included

administrative documents (reports), formal studies (unpublished, published), newspaper articles and other related documents. Surveys contribute quantitative data which lends support to the use of multiple sources of evidence and can strengthen the validity and reliability of the case study approach (Yin 2003).

3.1.4. Mixed Methods (Mixed Quantitative-Qualitative)

This study also uses both qualitative and quantitative methods or what is described as adopting mixed methods (Table 3-2). The benefit of using mixed methods is that it is not restricted to collecting and analysing data but the overall strength of the study will be greater than if qualitative or quantitative methods were used separately (Creswell 2009). Mixed methods research is appropriate for this study because a broad understanding about formal finance can be captured by quantitative data from a survey while qualitative data can be used to interpret and explain those data. Besides that, the study looks at households, banks, and institutions in an holistic way, so a range of different methods were needed.

Table 3-2. Quantitative, mixed, and qualitative methods

Quantitative	Mixed	Qualitative
Pre-determined	Both pre-determined and emerging methods	Emerging methods
Instrument based questions	Both open and close ended questions	Open ended questions
Performance data, attitude data, observational data and census data	Multiple forms of data drawing on all possibilities	Interview data, document data, and audio-visual data
Statistical analysis	Statistical and text analysis	Text and image analysis
Statistical interpretation	Across databases interpretation	Themes, patterns and interpretation

Source: Creswell (2009)

3.1.5. Concurrent Triangulation Strategy

With the research approach used in this study, both quantitative and qualitative data were gathered at the same time or in one phase of the research using several methods (which can lead to triangulation, or cross-verification) to establish "if there is a convergence, differences or combination" (Creswell 2009). The advantage of this model is the balancing of the weaknesses of one method with the strength of others.

This study uses several different sources of data and compared them to confirm accuracy and validity. Data from surveys, for example, was cross checked with data from interviews, and data from surveys or interviews can sometimes be confirmed by documented data. The use of many different sources of evidence leads to the strength of case study research (Yin 2003).

3.2. Research Methods/Tools

This research utilises primary and secondary data: primary data was gathered through surveys and interviews while secondary data came from statistical sources, government publications, reports, and scientific papers including data from previous research about cattle production in East Java Province, Indonesia. Both descriptive statistics and statistical analysis have been used to analyse data from surveys and interviews. The research draws on and compares multiple sources of independent data (by triangulation) as cross-checking data sources provides valid and more reliable results. Detailed techniques used to answer the research questions relevant to this study are shown in Table 3-3.

Table 3-3. The detailed methods used to answer research questions in this research

No	Objectives/Research Questions	Themes	Data Collection Methods/ Sources of Data			Data Analysis Tools/Techniques
			Survey	Interview		
	Overall aim: to examine the role of finance in the development of household cattle fattening operations in East Java					
	Objective 1: To understand the broad national environment in which "finance of fattening" takes place in East Java					
1.	**What is the broad national environment in which "finance of fattening" takes place across the research sites?**					
	a. What are the major structures and trends in the Indonesian beef cattle industry?	• Cattle production system in Indonesia • Government policy in cattle production			Reports, statistics and previous studies	
	b. What are the key structures in the Indonesian financial sector, of relevance to bank lending in agriculture, livestock, and cattle fattening?	• Type, structure of finance sector in Indonesia • Development of agricultural credit • Credit policy for cattle			Reports, statistics and previous studies	
	Objective 2: To assess the factors that determine (constrain or enable) the demand for finance from cattle fattening households in East Java.					
2.	**What are the determinants of demand for finance amongst cattle fattening households in East Java**?					
	a. What is the structure, scale and systems related to the cattle fattening sector?	The typology of cattle fattening in East Java, the scale, input production and marketing of cattle	Fattener households		Reports and previous studies	Descriptive analysis
	b. What are the main factors determining access to credit for cattle fattening households?	Factors that determine access to credit	Fattener households	Farmers' groups & agribusiness	Reports and previous studies	Statistic regression (logistic)

	c. How viable are these household enterprises? What are the determinants of profitability and what is the capacity of households to repay loans?	• The profitability of cattle fattening • Factors leads to increase profit • The capacity of household to repay loan	Fattener households	Farmers' groups		Budget analysis
	d. Is cattle fattening profitable under commercial interest rate loans?	• The profitability of cattle fattening under subsidised and commercial interest rate	Fattener households			Budget analysis
	Objective 3: To identify the factors that determine (constrain or enable) the supply of finance from banks (and other formal financial institutions) in East Java.					
3.	**What are the determinants of the supply of finance from banks for household cattle fattening?**					
	a. What are the main channels for finance for cattle fattening (bank, non-bank, formal/informal)?	Types of finance for cattle fattening (bank, company, government)	Fattener households	Bank, company, cooperative	Annual report	Descriptive, statistical
	b. What are the financial structures (banks, branches) in Indonesia and how does this affect supply of capital for fattening?	The structure of banks (central, branch, etc.) and the effect of those structure in supplying loan		Bank, company, cooperative	Annual report	Descriptive, statistical
		The supply of credit for agriculture, livestock and cattle fattening		Bank, company, cooperative, government	Annual report	Descriptive, statistical
		Regulation related to finance cattle fattening		Bank, company, cooperative, government	Annual report	Descriptive, statistical
	c. What are the financial products, lending criteria, and assessment processes of the banks (productivity, competitiveness, risk, serviceability, working with groups to reduce transaction costs, collateral, guarantors)?	• The finance products (credit, saving, insurance) • Loan arrangements (loan criteria, linkage) and assessment process of the banks		Bank, company, cooperative	Annual report	Descriptive, statistical

	d. What are the incentives and main constraints for lending institutions to increase the availability of loans especially for cattle fattening?	Factors determine supply of finance for cattle fattening		Bank, company, cooperative	Reports and previous studies	Descriptive, statistical
	Objective 4: To identify the major policy and institutional arrangements that constrain or enable the flow of finance between banks and cattle fattening households.					
4.	**What is the role of intermediate actors and services in facilitating the viable flow of credit from banks to cattle fattening households?**					
	a. Who are the key intermediate actors (government, research agencies, agribusiness, local groups) that link the lending institutions with cattle fattening households across the research sites?	There are five types of actors (government, research, agribusiness, local group, company or other agencies)		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Reports	Descriptive
	b. What are their roles in facilitating finance for cattle fattening?	The role of several actors involved in financing cattle fattening based on different types of cases studies		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Reports	Descriptive
	Objective 5: To identify the structures and performance of different types of “finance for fattening” scheme in East Java.					
5.	**What are the structures and performance of different types of “finance for cattle fattening” schemes?**					
	a. What typology can be used to compare and assess different types of schemes?	Different type of cases studies based on type of farmers, type of lenders, agencies that link the parties, and type of guarantor		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)		Descriptive, prescriptive

	b. What loan assessment processes and linkages do different organisations use?	Structures and the types of loans that farmers have accessed		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Report	Descriptive, prescriptive
	c. What is the profitability of these schemes?	The costs and revenues of the farmers	Fattener households	Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)		Budgeting analysis
	d. How do the different schemes perform against relevant criteria (sustainability, access, alignment with program objectives, risks, profitability)?	Some criteria such as sustainability, access, alignment with program objectives, market risks, profitability etc.		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)		Descriptive, prescriptive, budgeting analysis
	Objective 6: To recommend measures that would improve the flow of finance from banks to cattle fattening households, with measures aimed at banks, households, and (intermediate/linking) agencies.					
6.	**What measures/recommendations can improve the performance of different financial options for cattle fattening?**					
	a. What measures can be targeted at households (e.g. assistance in doing budgets, loan applications etc.)?	• The needs of farmers • Assistances in business planning and loan application		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Previous studies	Prescriptive
	b. What measures would be useful for banks (e.g. loan terms and arrangements)?	Loan terms and arrangement		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Previous studies	Prescriptive

	c. What measures can be used to integrate linking agencies?	• Technical support/assistance/technology to increase returns and cashflow for household and reduce risk for banks		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Previous studies	Prescriptive
	d. What Government policy is needed to improve the availability of finance for cattle fattening to small-holders?	Government policy to improve supply and demand for finance by cattle fattening households		Key actors (bank, agribusiness, Government, village leaders, farmers, etc.)	Previous studies	Prescriptive

3.2.1. Household Survey

A household survey was conducted during the first fieldwork over three months from July 3, 2015 to October 10, 2015. Small- to medium-sized cattle fatteners that fell into two categories, those who have access to credit and those that do not, were interviewed. This allowed identification of the factors that enable or constrain access to credit.

Semi-structured questionnaires were used to gather information about the structure, scale, and system of cattle fattening in the research location. Factors that determine demand for credit amongst cattle fattening households were identified. Questions which reflected the following five topics were asked: 1) the characteristics of farmers; 2) cropping systems; 3) cattle production (management, scale, feed, cattle marketing, budget); and the structure of farmers' incomes; and 5) credit. Other qualitative responses from respondents were noted. The number of questions was about 50 which took approximately 1-1.5 hours. These questions were tested in a trial survey of some selected cattle fatteners to check responses to questions and to refine the questionnaire before the full-scale survey was conducted. This survey did not involve other enumerators.

Sampling methods

Sampling to identify the farmers for interview was divided into three steps which involved choosing the research area, the classification of farmers, and selecting respondents as shown in Figure 3-1. The first step was purposive selection of the research areas. Two districts in East Java province were selected based on factors mentioned in Section 3.4. Second, fattening areas or farmers' groups were selected. At the third stage, simple random sampling, was used to select the respondents who were divided into two sub-groups, farmers with and without access to credit. The total number of respondents selected for this household survey were 102 respondents of which 54 had received credit and the other 48 respondents did not receive credit.

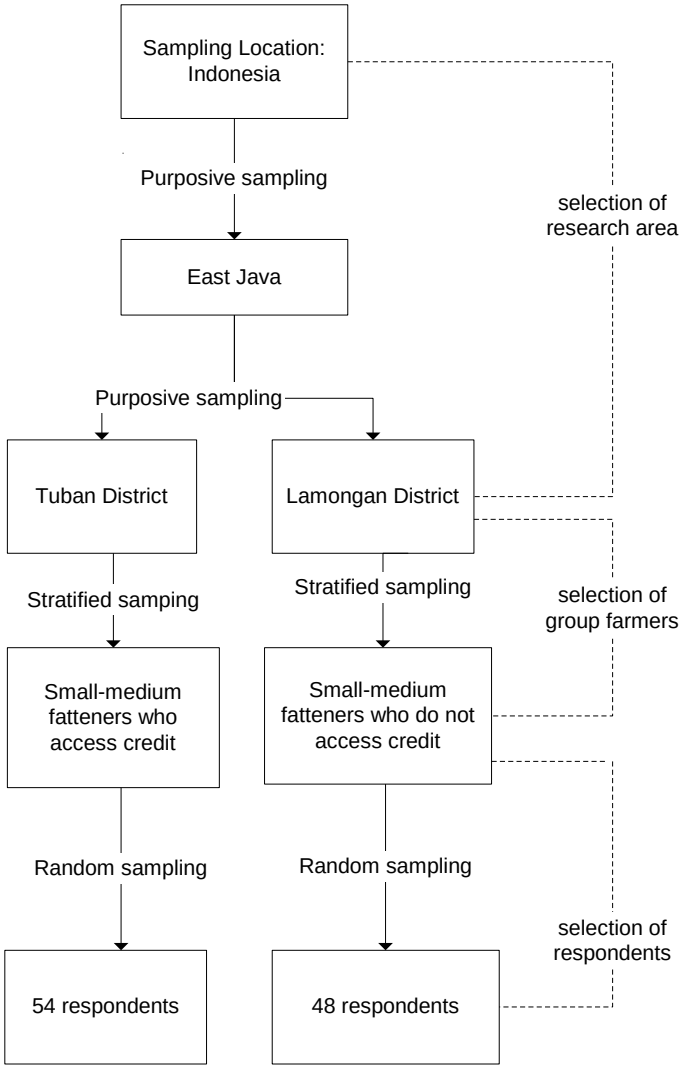


Figure 3-1. The steps to select sampled households

3.2.2. Interviews

Interviews were conducted during the first and second periods of fieldwork (December 10, 2017–February 18, 2017) using semi-structured questionnaires. The questionnaires were pre-tested in the research locations by direct interview with respondents. Interviews involved a number of key actors such as village leaders, representatives of farmers' groups, bank staff, traders, agribusinesses, government agencies, extension staff, and research institutions.

Open-ended questions were used to gather information and opinions related to credit, government policy, and institutional settings, including ideas about what was successful or not when applying for credit, opinions or perceptions about formal banks, and how credit arrangements influenced their successful or unsuccessful attempts to apply for credit. Questions were developed to address the research questions (Chapter 1, Section 1.3).

There were six different questionnaires used in the interviews with key farmers, banks, village leaders, agribusinesses, government agencies, and research institutions. There were fewer questions than for the household survey, but most were open-ended questions, so interviews still took approximately 1.5 hours.

Interview sampling methods

The farmers interviewed are a sub-set of all of the respondents who participated in the survey. The lower number of farmers interviewed allowed more detailed information to be collected. Interviews were conducted with 47 farmers (25 from Tuban and 22 from Lamongan) and these respondents were selected on the basis of knowledge or position (for example, the head of a farmers' group, or group member with better knowledge). As these respondents were representative of a particular sub-group, they provided quality insights.

In addition to interviewing farmers on the demand side of the finance market, interviews were also conducted on the supply and institutional sides of the market. These interviews included four village leaders; 14 staff from lending institutions (banks, companies, cooperatives, local government); 14 representatives from agribusiness (traders, butchers, feed mill, integrated cattle producer); and 7 respondents from Government and research institutions. The interviews provide the major source of data in this segment. Actors relevant to the research sites and questions were identified through two sources: from farm and village level interviews; and from key informants familiar with "finance for fattening" programs.

The information about banks or other lending institutions came from farmers who had already received credit or from the list of banks that participate in the KKPE program (Direktorat Pembiayaan Pertanian 2014a). The Central Government staff were from Directorate General of Livestock and Animal Health (DGLAH) and Directorate General of Agricultural Infrastructure (DGAI), Ministry of Agriculture (MoA), while Local Government such as the Livestock Services Agency (LSA) in the Province were also involved due to their role in supporting government programs for farmers. Research institution staff from the Assessment Institute for Agricultural Technology (AIAT) and Gadjah Mada University were also interviewed to gain information about government policy and their roles in financing cattle fattening. In addition, agribusiness such as traders, feedlot operators or butchers were other key players interviewed. These parties have a good relationship with farmers and support farmers in their farming activities. Direction to access these actors

came from farmers or information from the LSA. Access to all respondents was facilitated by a supporting letter from the University of Queensland.

3.3. Data Analysis

3.3.1. Descriptive Statistics and Statistical Analysis

Data gathered through the survey were analysed using descriptive statistics including mean, minimum, maximum, frequency, or percentages while statistical analysis involved determining associations between variables (logistic regression) and analyses of significance (t-test, ANOVA). The Statistical Analysis System (SAS) software was used to analyze quantitative data from the household survey.

Data from the survey were analysed using the binary logistic regression modeling technique through SAS software to determine factors facilitating access to credit. There are two categories in the dependent variable, that is, event A and non-event A (Harrel Jr 2001). Moreover, Harrel Jr (2001) suggests that the model shows how a set of predictors (explanatory) variables (X's) are related to a dichotomous response variable Y (ln (Pi/1 – Pi). The dichotomous response variable Y= 0 or 1 where Y=1 indicates the circumstance of the event of interest while Y=0 represent otherwise. The dummy variables, also known as indicators and bound variables, characterize dichotomous responses.

In this study, since only two options were available, namely "access to credit" or "no access to credit" a binary model was set up to define Y=1 for the situation where the fatteners obtained credit and Y=0 for situations where the fatteners did not access credit from either formal or informal sources. Assuming that X is a vector of explanatory variables and *p* is the probability that Y=1, two probabilistic relationships as proposed by Wooldridge (2009) can be considered as follows:

$$p(Y=1) = \frac{e^{\beta x}}{1+e^{\beta x}} \quad (1)$$

$$p(Y=0) = 1 - \frac{e^{\beta x}}{1+e^{\beta x}} = \frac{1}{1+e^{\beta x}} \quad (2)$$

Wooldridge (2009) concluded that since Equation (2) is the lower response level, that is, the probability that farmers did not access credit from formal or informal sources, this by convention will be the probability to be modelled by the logistic procedure. Both equations present the outcome of the logit transformation of the odds ratios which can alternatively be represented as:

$$\log it[\,\theta(x)] = \log[\frac{\theta(x)}{1-\theta(x)}] = \alpha + \beta 1x1 + \beta 2x2 + \cdots \beta kxk \quad (3)$$

thus, allowing its estimation as a linear model for which the following definitions apply:

θ = logit transformation of the odds ratio;

α= the intercept term of the model;

β= the regression coefficient or slope of the individual explanatory variables modelled;

Xi = the explanatory or predictor variables.

The logistic regression in this study can be specified as:

$$Yi = \alpha + \beta 1x1 + \beta 2x2 + \beta 3x3 + \beta 4x4 + \beta 5x5 + \beta 6x6 + \beta 7x7 \ldots + \mu k \quad (3)$$

where, Yi = the dependent variable defined as the access to credit by small-holder farmers = 1 and 0 otherwise; α = constant and intercept of the equation;

X1 = farmers' education;

X2 = having off farm and non-farm occupation as a primary occupation, 1 = had off-non-farm occupation and 0 = otherwise;

X3 = total land owned;

X4 = participation in group, 1= yes and 0 = otherwise;

X5 = total of all cattle owned;

X6 = type of trough, 1 = standard trough made from concrete and 0 = otherwise;

X7 = income from cattle per period.

In addition, interview data gathered which was mostly qualitative data, was used in the descriptive, explanatory, and prescriptive analyses to enrich the quantitative data from the survey. Thematic content analysis was used to interpret qualitative information, including transcripts. Classification of data from interviews was completed manually by grouping responses according to several themes with each theme forming a story.

3.3.2. Cashflow and Budget Analysis

Farm budgeting is an important analytical tool used in the thesis. For example:

- Representative household budgets for small, medium and large cattle fattening households (with and without credit) were established, based on the farm survey data).
- Two forms of budget were developed: a cashflow analysis to establish the capacity of farmers to take out and repay loans; and the other, a full household budget, which includes non-cash items including household labour and opportunity costs of the farmer's own capital.

- These two budget analyses are used in Chapter 5 to assess the profitability and viability of cattle fattening to gain a greater understanding of the system, what incentives may apply, the determinants of profitability, and capacity to enter into the business and repay loans.
- Budget analysis is also used in Chapter 8 to compare the profitability of different models of financing for fattening households with different institutional settings. Variables including productivity, loan arrangements (interest rates and term), prices, and institutional support were changed to analyse the effects on profitability and risk.
- Budget analysis of each scheme can indicate whether the flow of credit in each scheme is able to increase farmers' incomes and reduce the failure rate and risk to the business. This budget analysis is also used to assess each scheme that currently exists in the research area, especially to determine the sustainability of the business and to identify incentives for lending institutions to make loans.

3.4. Research Sites

The study was conducted in the eastern part of Indonesia in East Java province (Figure 3-2). This province accounts for a large proportion of the total cattle population in Indonesia (about 28%), which implies that the development of cattle production will be concentrated in this province. Even as a large consumer of beef, the province also supplies beef to other areas such as DKI Jakarta, West Java, Central Java, Lampung, and North Sumatera. East Java is also a transit area for cattle moving from other production areas such as West Nusa Tenggara, East Nusa Tenggara and Bali to consumer areas such as West Java, DKI Jakarta, Sumatera, and Kalimantan. Two districts in East Java, Tuban and Lamongan, were selected because beef production is important and Local Government plans to develop and support cattle fattening in these areas.

The other reason is that most cattle enterprises in Indonesia, especially in East Java, are integrated with cropping systems (Herrero et al. 2009; 2013) although in some places, they may also be based on pasture. This implies that the results from this study are relevant to the development of cattle production in Indonesia based on feed resources from cropping systems. The number of cattle fattening households in East Java is increasing (Priyanti et al. 2012b), with several programs established by the Government (SMD, SPR, subsidised credit), and their linkages with commercial feedlots.

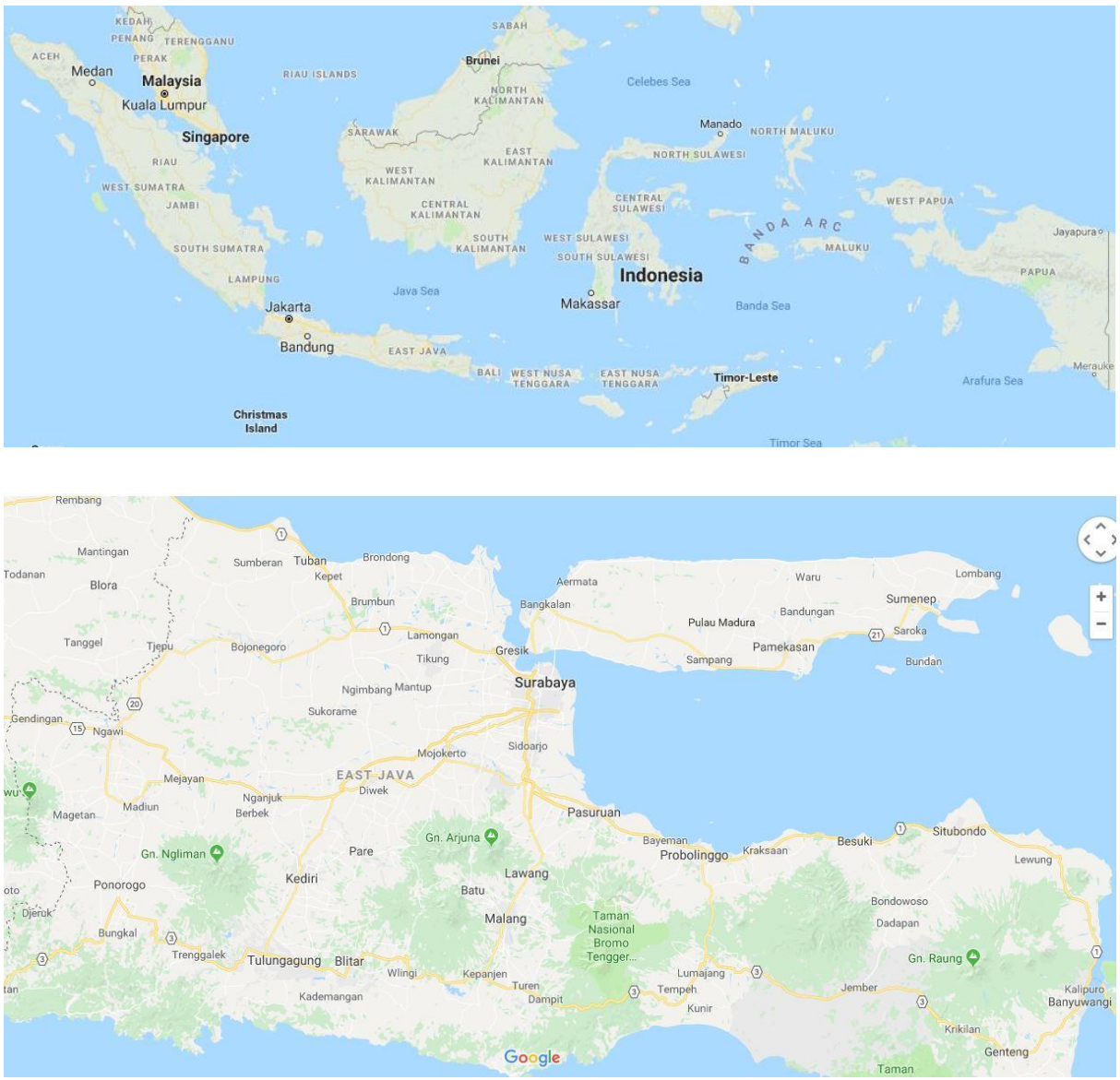


Figure 3-2. The map of Indonesia (above) and location of research site in East Java Province (below)

CHAPTER 4 THE INDONESIAN CATTLE AND FINANCE SECTORS

This Chapter commences with an outline of the Indonesian cattle production sector particularly in areas that have a high population of cattle. Cattle production systems in Indonesia are categorized into several types based on feed resources and agro-climatic information (pasture/grassland vs intensive systems); and type of cattle producer (small, medium and commercial producers, CCOs, or cattle fattening). The category of interest to this study is cattle fattening by small- to medium-scale farmers.

Accessing formal credit in Indonesia is a problem for these farmers due to asymmetric information and lack of collateral. This can be seen in the percentage of credit provided by banks to the agricultural sector, especially for livestock which receives only 7-15% of total credit. To provide support for the livestock/agricultural sector, the Indonesian Government established a subsidised credit scheme which has several advantages and disadvantages. The following section describes the agricultural finance sector in Indonesia and more specifically finance for the cattle fattening sector.

4.1. Cattle Production Systems in Indonesia

This section begins with the overview of the Indonesian cattle production sector especially in areas with a larger cattle population (4.1.1), followed by an overview of the types of production systems characterised by feed sources and breeds of cattle (Section 4.1.2). Section 4.1.3 then introduces Indonesian cattle producers based on the scale and degree of commercialization (commercial *vs* semi-subsistence); enterprise type (cow-calf, cattle fattening, and mixed); types of fattening (feed lotters *vs* fattening households); and contractual relationships. The final section explains Indonesian Government policy which aims to support cattle production (Section 4.1.4). Together, this Chapter provides important background for the local level analysis and case studies in Chapters 5 and 8.

4.1.1. Macro Statistics

The Indonesian cattle herd increased slowly during 2005-2013, while there was a significant increase of total beef consumption. Data from Kementerian Pertanian (2016) suggests that beef cattle consumption reached 2.4 kg/capita/year in 2015 (Figure 4-1) with a human population of 255 million (The World Bank 2018). This demand could be met by 29 million head of cattle on the assumption that only 14-15% of the total cattle population can be slaughtered to maintain herd sustainability as reported by Krisnamurthi in Ben (2013) and Kementerian Pertanian (2016). However, the cattle population in Indonesia in 2017 only reached about 16.6 million head or half the required number (Figure 4-2).

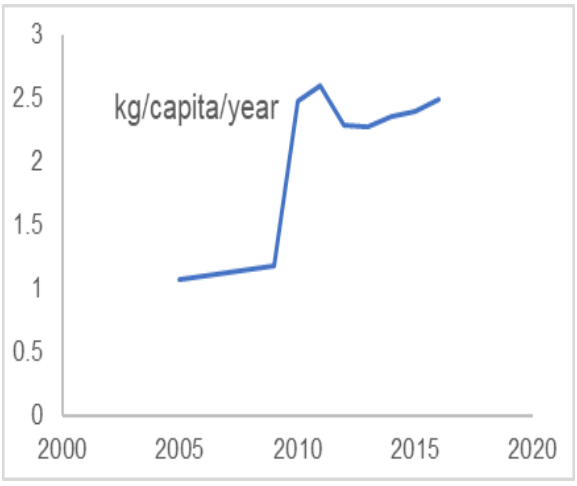


Figure 4-1. The consumption of beef in Indonesia from 2005-2015

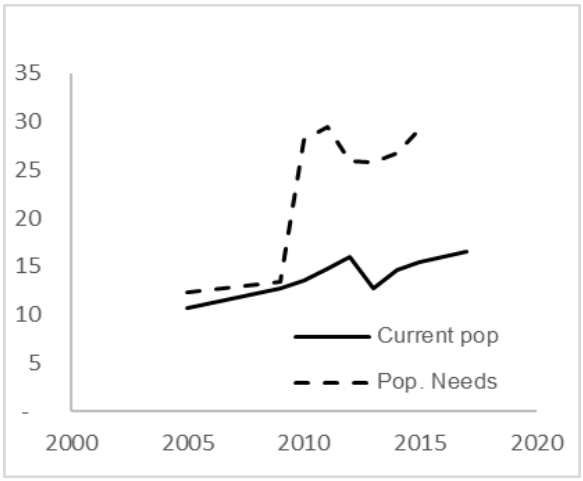


Figure 4-2. The gap between current cattle population and the needs (million head)

The supply of cattle in Indonesia faces several problems which generally are related to the procurement of inputs such as low quality and poor productivity of breeds; low quality and quantity of feed, poor cattle management, inefficient marketing systems, and government policy. These constraints are inter-related, but strategies used to address them are often undertaken independently (Yusdja & Ilham 2004). Efforts by the Government have included assistance to use artificial insemination, control and eradication of diseases, and bans on the slaughter of productive females and breeders (Soehadji 1995). However, these measures have not achieved significant growth in the cattle population in Indonesia.

The supply situation is exacerbated by an age and sex imbalance in the cattle population with a low proportion of female calves, creating a flow on affect for future herd structure. Table 4-1 highlights this problem where the proportion of cows in Indonesia in 2011 was 68%, mostly adult cows (66%) while the remainder were young heifers and calves. At the same time, the proportion of male cattle (32%) was not significantly different according to their ages.

Table 4-1. Proportion of cattle based on sex and age in Indonesia (%)

Type of cattle	Female	Male
	68	32
Adult	66.1	30.7
Young	19.9	38.5
Calf	14.0	30.8

Source: PSPK (2011)

The number of cattle in feedlots is reported to be about 16% of the total population in Indonesia. This is indicated by the number of cattle slaughtered which was about 2.6 million in 2013 (Directorate General of Livestock and Animal Health Services 2013).

The cattle population in Indonesia is spread out over several provinces but mostly around Java, North Sumatera, South Sulawesi, Lampung and Nusa Tenggara (Table 4-2). Other provinces contribute less than four percent of the total national population. This indicates that some areas are large producers of cattle while elsewhere they act mostly as consumers. The consumer areas are mostly in Java, DKI Jakarta, and Sumatera. East Java, Central Java, and Sumatera can meet their demand from their own production, while DKI Jakarta and West Java are supplied from production areas like East Java and Nusa Tenggara. Therefore, cattle production in East Java is important as the focus of this research.

Table 4-2. Main beef cattle provinces in Indonesia in 2016

Provinces	Total cattle population (head)	Percentage of total cattle population
East Java	4,407,807	27.5
Central Java	1,674,573	10.5
South Sulawesi	1,366,665	8.5
West Nusa Tenggara	1,092,719	6.8
Lampung	665,244	4.2
East Nusa Tenggara	984,508	6.2
North Sumatera	702,170	4.4

Source: Directorate General of Livestock and Animal Health Services (2017)

4.1.2. Types of Production System Based on Resources

Cattle production systems in Indonesia can be categorised by the diversity of production systems (feeds and breeds). An overview of these categories puts the subject of this thesis about cattle fattening households in East Java into perspective (with cattle-cropping systems).

Variety of feed sources

Cattle production systems in Indonesia show a great deal of variety depending on agro-climatic conditions and feed sources. In some parts of the country with larger land areas, low density of human population, and less suited to cropping such as East Nusa Tenggara (NTT), cattle are produced on pasture or grassland-based systems. These grasslands with native grasses including *Ischaemum, Axonopus,* and *Cynodon* cover only 850,000 to a million ha. However, much of NTT with its 3-4 months wet season and 8-9 months dry season, and less fertile soil means that the quality of grass is low. This

condition is exacerbated by the growth of weeds such as *Chromolena odorata* (Wilson & Widayanto 2000). Therefore, the introduction of tree and other legumes such as *Leucaena* (better known as lamtoro), *Calopogonium, Desmodium*, and *Arachus* species, has improved infertile soils and reduced weed growth. Tree legumes are planted in alleys among food crops as hedgerows and fed to cattle through a cut and carry system. Some studies summarised by Panjaitan et al. (2014) reported that Bali cattle with 80% of *Leucaena* in their diets combined with corn straw (13%) and native grass (7%) could gain 0.42 kg per head per day. This is 60% higher than traditional production systems in Lombok and West Nusa Tenggara (NTB) (Panjaitan 2012).

Most cattle in Indonesia are produced within the arable cropping areas (Herrero et al. 2009; 2013). In these areas, forage is provided by the intensive cut and carry method which is commonly used in Java, Madura, and Bali. Farmers in East Java feed their cattle on crop residues such as rice straw, maize stover, rice bran, or other wastes from food or feed manufacture. A study by Priyanti et al. (2012a) and Hanifah et al. (2010b) showed that farmers in lowland areas in East Java produced three crops a year, with the dominant crops being rice, maize, and mung bean. In the upland areas, farmers mostly produce one to two crops, with fewer farmers producing three, and the dominant crops are maize, cassava, and mung bean. Therefore, rice-straw and maize stover are the major feed sources for cattle along with the available crop residues, and cattle production has the potential to develop in these areas.

While still based on crop residues, cattle production systems are slightly different in Bali, where farmers usually use waste vegetables combined with rice straw. Generally, the farmers stock feed in the harvest season to be used during subsequent planting seasons or in dry weather. As in other Indonesian irrigated areas, the crop pattern in Central Lombok, NTB consists of two rice crops then one non-rice food crops a year which may be soybean, maize, peanuts, and mung bean.

In Sumatera (Lampung), Sulawesi, and Kalimantan Islands, another feed source is based on plantation residues. In this feeding system, the farmers tether their cattle for grazing below plants like oil-palm, cocoa, or other plantations and use the by-product of those plantations such as oil-palm fronds as cattle feed (Mathius 2008). In Lampung, there are also paddy fields cropped 1-2 times a year, followed by maize and cassava in the dry season. As in other areas in Indonesia, rice-straw and maize stover are important sources of feed in addition to the by-product “onggok” which originates from cassava processing in Lampung (unpublished report).

Breeds of cattle

There are several types of cattle in Indonesia comprising both local and crossbred cattle. Based on the Indonesian cattle census in 2011 (PSPK 2011), breeds of cattle kept in Indonesia consist of Bali cattle (32%), Ongole cattle (29%), Madura cattle (9%), while the rest are crossbreds (Limousin, Simmental, and others) which together make up about 30% of the herd (Table 4-3).

Table 4-3. Proportion of each breeds of cattle based on sex and age

Types	Breeds				Total
	Bali	Ongole/PO	Madura	Others	
Total male	1,493,290 *(32%)*	1,191,969 *(25%)*	434,735 *(9%)*	1,601,103 *(34%)*	4,721,097
Calves	460,973 *(32%)*	380,489 *(26%)*	87,630 *(6%)*	518,337 *(36%)*	1,447,429
Young	538,232 *(30%)*	472,537 *(26%)*	162,823 *(9%)*	645,343 *(35%)*	1,818,935
Adult	494,085 *(34%)*	338,943 *(23%)*	184,282 *(13%)*	437,423 *(30%)*	1,454,733
Total female	3,296,487 *(33%)*	3,089,195 *(31%)*	851,136 *(8%)*	2,866,458 *(28%)*	10,103,276
Calves	486,789 *(34%)*	386,290 *(27%)*	95,379 *(7%)*	446,441 *(32%)*	1,414,899
Young	630,680 *(30%)*	585,415 *(30%)*	195,884 *(10%)*	598,564 *(30%)*	2,010,543
Adult	2,179,018 *(33%)*	2,117,490 *(32%)*	559,873 *(8%)*	1,821,453 *(27%)*	6,677,834
Total	4,789,777 *(32%)*	4,281,164 *(29%)*	1,285,871	4,467,561 *(30%)*	14,824,373

Source: PSPK (2011)

In some parts of Indonesia, the number of local breed cattle is less than the number of crossbred cattle. This is the case in East Java, where the Local Government uses artificial insemination to increase the cattle population. This impacts negatively on local genetic resources and it is now difficult to find local breeds, especially male cattle, in this region. This problem is also happening in Madura with its local “Madura cattle”.

The characteristics of local breeds of cattle are different. For example, Bali cattle which are dominant in Eastern Indonesia and South Sulawesi, have good fertility and are a hardy breed which can cope with low-quality feed. However, this breed has a low growth potential with a lower average daily weight gain compared to crossbred cattle. In contrast, European crossbreed cattle perform well when supported by good quality and adequate quantity of feed, especially in their early years or during lactation. This study focuses on crossbred cattle as they are the majority in the research area. The growth of these breeds may improve profit from fattening and provide an incentive for farmers to access formal credit.

4.1.3. Types of Cattle Producers

The Indonesian cattle sector is comprised of several types of cattle producers based on characteristics that include scale, degree of commercialisation, enterprise type, types of fattening operation, and contractual relationships.

Commercial and traditional producers

Small-scale traditional cattle producers dominate the Indonesian cattle sector. Farmers in East Java keep only 1-2 head of cattle (Priyanti et al. 2012a); in NTB, cattle numbers are about 3-5 head per household (Waldron et al. 2013), and in NTT 5-7 head per household (Waldron et al. 2013). These producers feed their cattle with local crop by-products through the cut and carry system or graze them in the surrounding areas. Cattle producers also rely on family labour to run their operations. Farmers produce cattle for the market and seldom for their own consumption (except in NTT for ceremonies).

There are also commercial cattle producers with a large scale of production and access to markets for the purchase and sale of cattle. These cattle producers operate at a business scale to provide income to sustain their livelihood.

CCO vs cattle fattening

Cattle production systems can also be categorised in terms of the purpose for which their cattle are kept, or as mixed cattle enterprises. CCOs or breeding herds produce, grow, and sell calves and young cattle at various ages. In this production system, cattle are kept in extensive, intensive, or mixed feeding situations. Djajanegara and Diwyanto (2001) reported that CCOs are mostly established by small farmers with small-scale production and traditional management systems. Based on the Indonesian Census (PSPK 2011), the number of households which are involved in CCOs and breeding is about 4.8 million or about 71% of total households who keep cattle.

Another cattle production system is the growing and fattening operation, where farmers buy feeder cattle and sell off finished cattle. The cattle fattening sector tends to be more specialised and commercial in production (Waldron 2008). Some of the operations are large farms or feedlots which are large-scale and capital-intensive. However, there is also growth in fattening cattle by small farmers in some areas, particularly in NTT, NTB, Bali, East and Central Java (Yusdja & Ilham 2004).

While it is possible to differentiate between CCO/breeding and fattening operations, most cattle in Indonesia are turned off from “mixed cow-calf /fattening” operations, where the resulting calves are grown and sold out at slaughter age. Mixed production systems are dominated by small-scale, unspecialised cattle households. These systems are

dependent on the availability of resources (feed) in each area and the characteristics of the cattle being kept.

Types of cattle fattening

Cattle fattening in Indonesia can be classified into small-, medium-, and large-scale fattening operations based on the number of cattle kept. Small-scale fattening involves 1-2 feeder cattle, while medium-scale operations fatten 10-20 animals per period. The scale of cattle fattening is commonly still dependent on local feed resources, although some farms in the small- to medium-scale category buy feed such as rice bran, molasses, tofu waste, cassava, and rice-straw from the food industry or other farmers/traders (Hanifah et al. 2010b). While small-scale fattening is a non-corporate, household-based activity, Priyanti et al. (2012b) reported that the number of small to medium cattle fattening businesses in East Java has increased and most farmers have a strong desire to focus on cattle fattening as a business.

Large commercial feedlots such as those in Sumatra or Kalimantan can hold up to 3,000 animals (Priyanti et al. 2012b) with up to 12,000 turned off per year. These feedlots are commonly fattening feeder cattle for short periods of 3-4 months with high quality feed.

Contractual relationships

Small-scale cattle production systems in Indonesia vary in terms of the ownership of the cattle and input production. In owner-keeper households, one household owns the land and cattle, and contributes labour and feed resources. Other relationships exist however where the owner of the cattle places the animal with a keeper household, who uses their own land, labour and feed to keep the animal. This relationship between owner and keeper is often informal in rural areas. The keeper will get a portion of output depending on their informal contractual arrangement. For example, the owner may sell two calves with the first being for keeper and the second one for the owner; or the owner and keeper may share the revenue from the sale. Hanifah et al. (2010a) reported that the percentage of keepers in upland area of East Java (Malang) is about 30%, while in lowland area (Pasuruan, Probolinggo), it is about 46%.

Another type of contractual relationship also occurs between farmers and traders or neighbours or other family members such as fathers and sons. In this case, the division of roles is not just based on resources but based on the availability of capital. In some areas like NTT, there are also formal contractual relationships between farmers and large associations or village cooperatives (e.g. PUSKUD, *Pusat Koperasi Unit Desa*) that

provide cattle for small-holders where the output is again shared. Formal contractual relationships between traders/producers and fattening households also occur in East Java.

4.1.4. Government Policy in Cattle Production

This section describes National Government agricultural policy and the role of Local Government within the Indonesian cattle sector. At the National level, cattle is one of five agricultural sectors that are targeted to meet national "self-sufficiency" goals. Local Government also has goals and policy measures to support national programs.

The MoA has established a vision for the development of agriculture during the period 2015-2019 which aims to achieve "the sustainable bio-industrial agriculture system which produce healthy food diversity and high value-added products based on local resources for food sovereignty and farmers welfare". To support this vision, six strategic indicators were assigned including: 1) achieving self-sufficiency in rice, maize, soybean, sugar and meat; 2) increasing food diversification; 3) increasing high value-added and competitive products to fulfil export and import substitution; 4) supplying raw material for bio-industry and bio-energy; 5) improving farmers' incomes; and 6) achieving good government performance (Kementerian Pertanian 2015). To support the Beef Self-Sufficiency target, The Government of Indonesia established programs to increase cattle production (Figure 4-3).

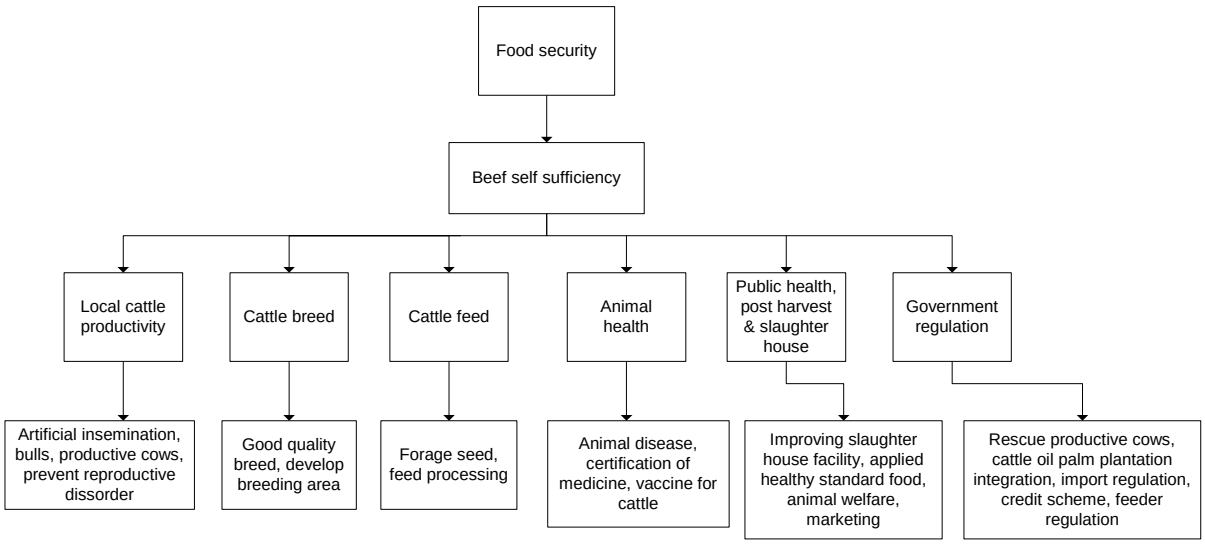


Figure 4-3. The Government policy to support beef self-sufficiency

One program to improve local cattle productivity is through the implementation of an artificial insemination program by Local Governments in East Java. It aims to support Beef Self Sufficiency, with the "Sapi Berlian" program with the objective to produce five million

head of cattle in five years. The program is based on a targeted growth of 3% in production, requiring extraordinary actions to be realised (Kadir 2009).

Another government policy aims to increase the supply of cattle breeds by developing Local Government breeding areas in Madura, where Sapudi Island has become a breeding centre for Madura cattle with a target of ten thousand cows. There is also a breeding centre for Bali cattle in Bali (Winarso 2014).

To increase the availability of feed, the Directorate of Feed, MoA conducted a pilot project planting native grass and legumes in 25 Provinces in Indonesia. The type of feed is dependent on the area to be planted. There are also opportunities for the development of feed from industry by-products.

The Local Government in Bali also participates in a marketing program ("one door" Livestock Services for cattle marketing) and determines the price for feeder cattle reported a IDR6 million per head for cattle with 105 cm height by Winarso (2014). However, the price decided by the Government was too high for consumers, so they still tended to buy cattle from traders at a cheaper price.

In Jambi and other areas in Sumatera and Kalimantan, developing cattle production on oil-palm estates is required to increase the population of cattle. Oil-palm plantations receive benefits from cattle with income in the off season for palm oil and utilizing by-products from palm oil production.

Another program to support beef self-sufficiency is known as the “Cattle distribution program”, where cattle are supplied to farmers through community grants (BLM). Cattle are sourced from the budget of LSA and the Directorate of Breeding, DGLAH and is further reviewed in Section 4.2.5.

The Bachelor Village Building program or *Sarjana Masuk Desa* (SMD) is a training program from DGLAH that has operated since 2007, with objectives to support the development of agribusiness; 2) strengthen investment and infrastructure to develop cattle production; 3) increase production, productivity and the income of farmers; and 4) develop a livestock centre (Direktorat Jenderal Peternakan dan Kesehatan Hewan 2011).

This joint arrangement with SMD involves DGLAH and some fresh graduates who are appointed as managers to assist farmers/farmers’ groups particularly in accessing funding (Figure 4-4).

The candidate of the SMD who has a registered farmers’ group, submits a proposal to DGLAH for selection, interview, and verification. After approval, the Government conducts training on loan processing and transfers the loan to the bank account of the farmers’ group. Cattle can be purchased with 80% of the loam and 20% of the funds can

be used for other expenses such as renovation of pens, feed, veterinary expenses, development of feed resources, waste processing, farmers' group training, and administration fees. The progress of the group's business is reported to LSA and DGLAH every month and includes cattle numbers, the average daily gain of cattle, and the profit and the flow of the money used.

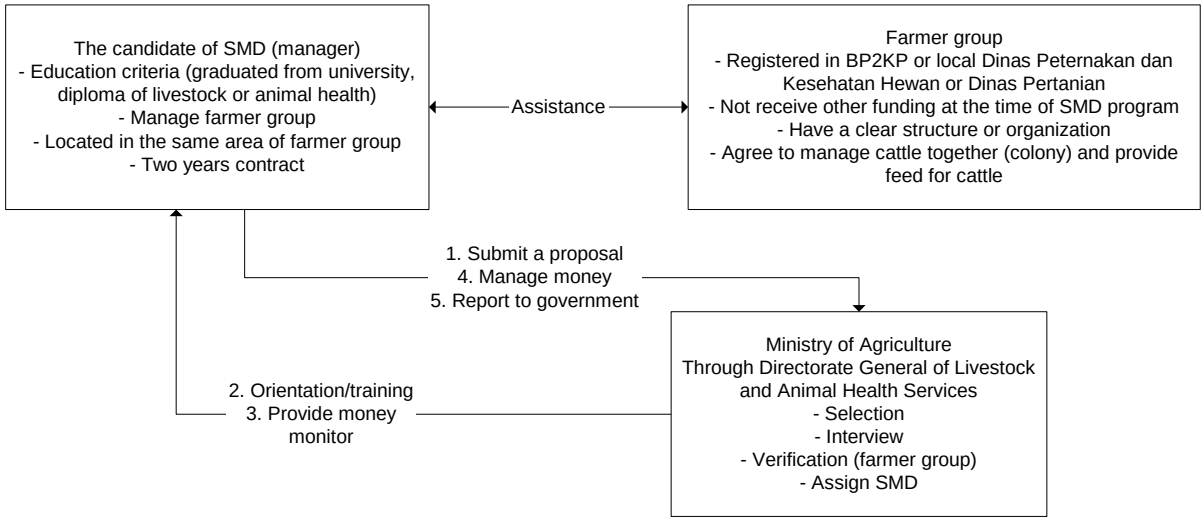


Figure 4-4. The arrangements for SMD program

This program is popular in the rural areas with the number of SMDs increasing every year. By 2012, the number of farmers' group involved had reached 2,694 (DGLAH cited in Refita (2016)), of which around 299 SMD groups were in East Java (Dinas Peternakan Propinsi Jawa Timur 2014). However, this program has not increased the wealth of farmers due to unachievable targets (Refita 2016). For example, 56% of farmers' groups were not located in a livestock area and about 57% of those areas did not have a competitive livestock subsector. It was also affected by a lack of monitoring from the relevant institutions, therefore it was proposed to strengthen the performance of farmers' groups and human resources.

Another program that supports the development of cattle is the Public Livestock Centre or *Sentra Peternakan Rakyat* (SPR). The Government is targeting the development of cattle production in set areas, so these SPRs provide support from several institutions to farmers' groups. Farmers' groups who wish to be involved in an SPR need to submit a proposal to the Government through the LSA-District. This program will utilise the Government budget of up to IDR one billion for SPRs, whereby farmers' groups will be given assistance from the LSA-District and other expertise provided by the Government.

In addition to the Government policies addressed above, interventions in the finance system aim to improve cattle production through the establishment of subsidised credit

schemes such as KUPS, KKPE, KUR (Section 4.2.3.) or using other local credit held by Local Government or banks. These are the instruments of interest to this study and discussed in detail in the following section.

4.2. The Indonesian Finance Sector

This section reviews the Indonesia finance sector and commences by identifying the types of finance available and the development of agricultural and cattle credit in Indonesia including credit policy for cattle fattening.

4.2.1. Types of Finance in Indonesia

Like the financial sector of other countries (Ellis 1992; Upton 1996) there are both formal and informal (discussed in Section 2.3.2) sources of finance in Indonesia. Formal finance is provided by formal lending institutions such as banks, cooperatives, or from Government (Figure 4-5). Formal finance from Government can be grants (in the form of cattle distribution) or subsidised credit. In the case of subsidised credit, Government collaborates with banks to provide the loans and subsidises them at a percentage of the interest rate.

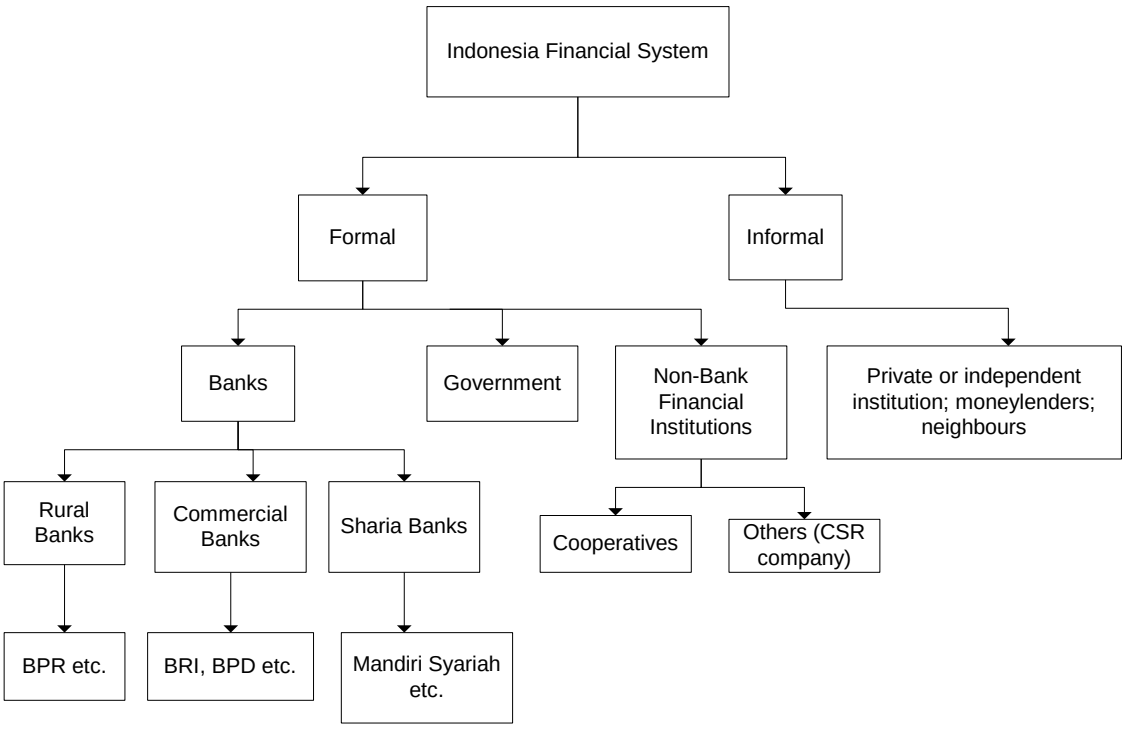


Figure 4-5. The structure of the Indonesian financial system

Informal finance that comes from family, neighbours, moneylenders, or other parties who have a good relationship with farmers (Section 2.3.2) is the most widespread system particularly for cattle. However, this system does not feature in this study, as cattle are

regarded as a secondary activity for farmers after farming and while they might borrow money for their farming activity, they may not for ther cattle enterprise that needs more money and has more risk.

This study concentrates on formal sources of finance, particularly from banks with commercial interest rates as well as government lending institutions with subsidised credit. The banks are major players in the Indonesian financial sector (Srinivas & Sitorus 2004), so formal credit markets have the potential to increase business activity at market rates which are known to be lower than rates offered by the informal markets.

4.2.2. Structure of Banking Finance Sector in Indonesia

All regions of Indonesia have several types of financial institutions. Indonesian banking statistics (Otoritas Jasa Keuangan 2017), record 1749 banks and about 40,605 bank offices in Indonesia. Those banks are categorised into commercial banks, Sharia banks, and Rural banks as showed in Table 4-4.

Table 4-4. The number of banks in Indonesia at October 2017

Types of banks	Number of banks
Commercial Banks	115
State Owned Banks	4
Foreign Exchange Commercial Banks	42
Non-Foreign Exchange Commercial Banks	21
Regional Development Banks	27
Joint Venture Banks	12
Foreign Owned Banks	9
Sharia Bank	15
Rural Bank	1,619
Total	1,749

Source: Otoritas Jasa Keuangan (2017)

Commercial banks or public banks provide financial services in the form of savings facilities and provide credit/loan services for industry including agriculture. They participate in the payments system and provide foreign exchange services (Budastra 2003). Rural banks provide the same services as Commercial banks but do not provide access to the payment system or foreign exchange services (Budastra 2003). Examples of Rural banks are the Bank Perkreditan Rakyat.

Commercial and Sharia banks are funded from a range of sources including third parties in the form of demand deposits, savings, and term deposits both for IDR and foreign exchange. Other activities include the banks' responsibilities to the Central Bank (BI), manage interbank liabilities, issue securities, and other inter-bank activities that enable the financial system to function. Rural banks receive funds from third parties in the

form of savings and term deposits, inter-bank liabilities, funds lent to them by other financial institutions (Otoritas Jasa Keuangan 2017). The composition of third party funds for each bank is mostly from term deposits as shown in Table 4-5.

Table 4-5. The composition of third party funds in different types banks (%)

Type of banks	Demand deposits	Saving	Term deposits
Commercial Banks	**23.6**	**30.5**	**45.9**
State Owned Banks	22.6	38.0	39.3
Foreign Exchange Commercial Banks	19.3	29.2	51.5
Non-Foreign Exchange Commercial Banks	4.3	12.3	83.4
Regional Development Banks	33.5	22.0	44.5
Joint Venture Banks	31.9	13.0	55.2
Foreign Owned Banks	60.3	9.2	30.5
Sharia Bank	**9.9**	**40.3**	**51.7**
Rural Bank		**30.7**	**69.3**

Source: Otoritas Jasa Keuangan (2017), data per October 2017

There is also a Central Bank in Indonesia called Bank Indonesia which has responsibilities in stabilizing the money supply, stimulating production and development, providing credit to banks, setting interest rates, and implementing the regulations to manage the money circulation (Srinivas & Sitorus 2004). The relationship between the Central Bank and other Commercial banks where those banks are managed, controlled and authorized by the Central Bank, includes the determination of interest rates. However, the rates set by the Central Bank do not include the element of risk which depends on the bank's assessment of their borrowers' activities. Thus, the interest rates for individual borrowers will not the same as the base rate of interest for bank credit (Global-rates.com).

While there are several types of banks in Indonesia, this study will only concentrate on the Commercial banks (such as State-owned banks, foreign exchange bank and regional development banks), as well as the Rural banks which provide financial services for cattle fattening. State-owned Banks have an important role in Indonesia as they control almost three-fourths of deposits and most assets of the banking system in Indonesia (Srinivas & Sitorus 2004). Moreover,

4.2.3. The Development of Agricultural Credit in Indonesia

Several credit programs have been introduced by the Indonesian Government to support agriculture, including livestock development. The Indonesian Government in 1967/1970 implemented the "BIMAS (*Bimbingan Massal*)" program to support self-sufficiency in rice. This subsidised credit program with a three percent interest rate from BRI, was able to achieve its aims and had a sound recovery rate (80% of loans repaid) for

the first five years. However, this rate declined to 57% as the Government forgave farmers these debts, and the farmers thought that BIMAS was making a grant (Ashari 2009). Later, in 1985, BIMAS developed into a commercial credit program called Farm Program credit or *Kredit Usaha Tani* (KUT), which was managed by village cooperatives (KUD).

KUT is one form of commercial agricultural credit with interest rates of 12% and provided for farmers who have already repaid BIMAS loans. The amount of KUT funding released until 1999 was IDR8 trillion, however, the repayment rate of KUT loans is low at about 25%.

In 2000, the Indonesian Government released the Food Security Credit program or *Kredit Ketahanan Pangan* (KKP) with the goal of enhancing productivity in the food industry. Banks involved in this program included BRI, Agro Bank, Bukopin, Mandiri Bank, and Rural Development Bank. The government released IDR2.1 trillion of credit for food crops, sugarcane, and livestock with a 12% interest rate for food crops and a 16% rate for livestock that was subsidised by the Government. KKP then changed to the Food Security and Energy Credit program or *Kredit Ketahanan Pangan dan Energi* (KKPE).

KKPE was developed in 2007, with the total credit allocation from 2010-2015 of IDR24.7 trillion (Table 4-6). However, the credit disbursement was low (only 49%) because the banks (that hold the liquidity and risk over the loan) were selective of creditors and farmers have only limited collateral. More detail of this credit will be discussed in Section 4.2.4.

Table 4-6. The total KKPE credit that can be accessed for livestock (million IDR)

Year	Total quota provided for livestock	Total quota provided for all sectors	Total credit disbursement for livestock	Total credit disbursement for all sectors
2010			1,185,859	1,319,600
2011			678,997	2,196,897
2012	2,407,552	7,688,889	1,337,550	3,841,788
2013	1,556,517	6,201,777	1,095,728	2,539,879
2014	2,407,552	7,688,889	690,566	1,761,770
2015	860,196	3,162,178	355,766	536,813
Total	7,231,817	24,741,733	5,344,466	12,196,747

Source: Direktorat Pembiayaan Pertanian (2014b)

Skim Agricultural Financing Services or *Skim Pelayanan Pembiayaan Pertanian* (SP3) aimed to enhance farmer access to credit through risk sharing between banks and the Government. It was designed especially for farmers with limited collateral. There are five guarantor banks associated with the program: Mandiri, Syariah Mandiri, Bukopin, Jatim, and NTB Bank. By April 2008, the total amount of credit distributed to farmers reached more than IDR421 billion but was dominated by the estate crops sub-sector. At

the end of 2008, this credit program was merged into the Business Credit program or *Kredit Usaha Rakyat* (KUR).

KUR is another commercial credit scheme for micro-, small-, and medium enterprises (MSMEs). This credit aims to reduce poverty by financing productive, feasible businesses, but is not bankable which means it caters for those who cannot provide the banks' requirements such as collateral. This scheme is based on a guarantee system which involved about 31 Commercial banks as the source of loans at commercial rates, with the Government providing 70-80% of the required guarantee), and two other guarantors (PT Askrindo and Perum Jamkrindo). In 2010, banks provided IDR17.2 trillion in credit for UMKM, but only 47% of that credit has been accessed, and was dominated by the trade, hotel, and restaurant sector (TNP2K 2012). In 2016, a new KUR program was established with subsidy support, and this will be discussed in detail in Section 6.3.2.

Cattle Breeding Business Credit or *Kredit Usaha Pembibitan Sapi* (KUPS) provides credit for financing breeding cattle, both dairy and beef cattle. This credit scheme uses a commercial interest rate with subsidies from the Government, and more detail of this credit will be discussed in Section 4.2.4.

Rural Agribusiness Development or *Pengembangan Usaha Agribusiness Pedesaan* (PUAP) provides IDR100 million to farmers' groups and each group is responsible to redistribute this credit to other groups. In this case, it is expected that farmers' groups can be developed as agribusiness micro-credit institutions. However, the development of this institution has taken up less than 20% of the total target (Hermawan & Andrianyta 2012) due to a lack of credit management skills, which often results in delayed disbursement of funds and farmers' perceptions that the credit is a grant which does not need to be repaid. A good relationship between farmers, Government (Local and Central), Banks, NGOs, and insurance providers is necessary to improve the management of this institution.

4.2.4. Credit for Livestock

The distribution of credit to agriculture in Indonesia is poor and, within the agricultural sector, a lower percentage of credit is distributed to livestock activities. Between 2012 and 2105, the percentage of MSMEs getting credit from Commercial banks, as well as credit lent to agriculture as working capital, was below 10 and 5% respectively (Badan Pusat Statistik 2017). This implies that the percentage of that credit allocated for livestock will be even lower.

One cattle credit scheme operating in Indonesia since 2007 is KKPE which is provided by both Commercial banks (BRI, Mandiri, BNI, Bukopin, CIMB Niaga, Agroniaga,

BCA and BII) and some Regional Development banks (BPD Sumatera Utara, Sumatera Barat, Sumatera Selatan, Jawa Barat, Jawa Tengah, DI Yogyakarta, Jawa Timur, Bali and Sulawesi Selatan). The interest rate, covered by Government, can reach 7.5% except for sugarcane where it is 4.5%.

During 2010-2015, the total credit available for livestock decreased by about 70% (Table 4-6). In 2015, banks provided IDR860 billion credit for livestock (27% of total quota), but only 41% of that credit was distributed to farmers (Direktorat Pembiayaan Pertanian 2014a). About 66% of total credit from KKPE was disbursed to the livestock sector. BRI has the largest share of this credit for livestock which amounts to around 40% of total KKPE credit.

The lack of access to KKPE credit is blamed on a number of factors according to the interviews with Government's staff. Firstly, farmers are not aware of this credit facility, particularly those farmers who live in remote areas. Secondly, the distribution of this credit is mainly through farmers' groups and as such does not reach small farmers. Finally, the viability of some farmers' business is poor (Dahri et al. 2015) and subsequently cattle fattening conducted by farmers who obtained KKPE credit achieved low profits due to the high prices of feeder cattle and lower prices of finished cattle.

Another cattle program running in Indonesia since 2009 is KUPS and offers subsidised credit for companies, cooperatives, and farmers' groups. This credit has a five percent interest rate per year for a maximum 6 years term (with a year of grace period). During 2010-2014, about 448 stakeholders (12 companies, 17 cooperatives, and 419 farmers' groups) accessed this line of credit with a total IDR617 billion distributed, about 15% of total credit provided by banks.

There are several reasons for the lower rate of uptake of KUPS (Direktorat Jenderal Peternakan dan Kesehatan Hewan 2014), including a lack of information about the program that allowed misperceptions between banks and related institutions in district areas to develop. Moreover, the breeding system which the credit scheme financed gives a lower margin of return due to long production cycles in relation to loan repayment periods and is exacerbated by technical problems such as low productivity. Finally, lack of collateral reduces access to this credit, especially in the case of small farmers. Other issues such as the payment of a subsidy every three months distorts bank liquidity and cashflows (Kementerian Keuangan 2014).

4.2.5. Credit Policy for Cattle

The Indonesian Government has participated in the financing of cattle production in several ways, through the provision of grants or subsidies for cattle directly from their budget, by encouraging private banks to provide increased percentages of their loan portfolios for livestock, or by encouraging the private sectors to provide support and finance for livestock production.

Cattle distribution however is a major way by which the Government attempts to increase cattle production. These programs aim to distribute cattle to farmers, so they do not need to apply for bank credit. A project in Waingapu, Sumba is one example, where the LSA distributed two potentially breeding heifers to local farmers who were obliged to return three female progenies over the next five years. Another example from Lampung, where LSA distributed Brahman Cross cattle to farmers through a “revolving system” to help them increase their scale of production. Each farmer received two pregnant cows and they have to return four calves to be distributed to other farmers and one calf given to the group (unpublish report). However, the sustainability of the program depends on the project and Government budget and tends to work depending on local regulation.

The cattle distribution program has potential to crowd out commercial players in financial markets. When farmers can get free cattle from the government, demand for formal credit will decrease. However, according to the interview with bank staff, this has had little effect on the bank’s operation due to the small percentage of farmers who can be involved in this program. Also, there is limited availability of the government program due to its limited budget.

Subsidised credit is another form of Government contribution to the finance sector and is evident in schemes such as KKPE, KUPS, and KUR. These policies could be appropriate for small-holders to increase the demand and uptake of credit due to their lower interest rates. However, subsidised credit has a negative impact for banks and farmers and distorts the finance market. High demand for subsidised credit leads to credit rationing, whereby banks will favour borrowers with good credit ratings. In this case, the aim of Government‘s policy to help the small-holder will not be achieved. Sumarto and Suryahadi (2000) and Braverman and Guasch (1986) indicate that the target of subsidised credit are unlikely to benefit as whatever credit is available is utilised by medium- to high-income farmers who can provide collateral and reduce the banks’ risk exposure. Moreover, low interest rates offered by this type of scheme may cause a credit squeeze (Pasha 2009) and discourage investment, which further exacerbates the problem.

Another policy measure implemented by government has been to encourage lending institutions and banks to provide finance for agriculture and trigger other institutions to support cattle production. For example, for the KKPE credit scheme, the Government introduced agreements with banks ensuring the provision of credit for agriculture. However, banks struggle to fulfil this requirement as finance assessment policies and processes preclude many farming applicants.

The Government may also force companies especially those growing estate crops to enter into corporate social responsibility (CSR) programs. This involves providing finance for oil-palm seed, fertilizer, and cattle for small-farmers and providing credit to their workers as happens in Bengkulu, Lampung and other regions. In East Nusa Tenggara, there are companies and benefactors who provide financial aid for farmers through PUSKUD (a village cooperative based in Kupang). This allows them to make an initial purchase of cattle (maximum two head) which are then grown and fattened for sale over 12 months. The farmers are then paid for the weight gain. This is a one-off program which has assisted 8,000 households with 400 still waiting on capital and sponsorship (Warriner 2013).

While support by the Indonesian Government for agriculture has been significant, it appears to have failed to increase the efficiency of farming operation or enhance farmers' incomes. It has been suggested that to increase farmers access to credit, the Government needs to develop the Agribusiness Microfinance Institution in rural areas to improve farmers access to finance, raise the productivity of agriculture and support the development of rural economies (Nurmanaf et al. 2006; Nuryartono 2007). Ashari (2009) also suggested that the improvement of program-credit needs to address credit allocating mechanisms by identifying the characteristics of credit targets (experience, type of business, scale), improving coordination between credit schemes, and developing capacity of those who manage credit assistance (to increase scale, skills, and accessibility).

The Government also needs to support farmers through the issue of land titles, development of infrastructure and agricultural technology and institutional assistance, to provide feasible means of production and marketing. They should also encourage mediation services, possibly through an informal institution, to help farmers in their relationship with banks. Ronodiwiryo (1982) cited in Hastuti and Supadi (2004) suggested that the distribution of credit should ensure that farmers who receive it are able to increase production and repay the credit after harvest; making selection and monitoring critical success factors.

The use of mediators such as NGOs or local mirco-finance distributors helps to connect the financial institutions with farmers as demonstrated in South Sulawesi where the International Finance Cooperation (IFC) assisted maize farmers to communicate with their banks by providing technical assistance and skills development (Nurmanaf et al. 2006). Okten & Osili (2004) found that these networks also provide quality information about financial institutions and the character of the borrowers, thereby reducing transaction costs. Further to this, these experiences may lead to the adoption of new technologies (breeds, farming techniques, or others).

4.3. Implications of Thesis Findings

Although there is a wide variety of cattle production systems in Indonesia, this study focuses on the development of household fattening operations. Cattle fattening of crossbred cattle within food cropping areas in East Java is discussed in depth including the feasibility of this business within Indonesia generally and more particularly in the research area.

The Indonesian Finance Sector provides funding to support agriculture including cattle fattening, particularly with subsidised credit. However, these mechanisms have been less successful than hoped in improving small-scale cattle production. A large proportion of available credit is distributed to large scale agriculture such as sugarcane or palm-oil plantations, with limited credit going to support livestock or more specifically cattle fattening farmers. This has been caused by weaknesses in selection, monitoring and evaluation of participants in credit programs (Nurmanaf 2007). In addition, high risk exposure and transaction costs lessen the likelihood of small farmers accessing available credit. Complicated application and approval processes also reduce farmer participation, especially when resources are needed rapidly (Wenner 2010). This study now aims to develop a way of providing finance for fattening cattle which is beneficial for farmers, lending institutions, and the Government.

CHAPTER 5 THE DEMAND FOR FINANCE BY CATTLE FATTENING HOUSEHOLDS

To increase the flow of capital flow to develop of the cattle fattening sector in Indonesia requires an understanding of the demand for finance by that sector of the beef industry. This understanding can be assisted through an analysis of household business and agricultural structures, including an overview of the actors involved, scale of production, types of producers, inputs required, and marketing methods. While some farmers use their own savings to finance cattle activities, other seek external capital to enter into or expand their cattle business. Decisions about business strategies and the role of external capital are affected by a range of factors such as having a primary occupation apart from cattle production, owning land and cattle, participating in farmers' groups, and potential income from cattle or scale of operation. This information was gathered by a survey of cattle farmers in the Lamongan and Tuban Districts of East Java. An understanding of the geography, climate, and commodity prices in those areas also assists understand the characteristics of cattle fattening farmers.

5.1. Overview of Selected Research Areas`

East Java is the largest beef producing province in Indonesia and holds 28% of the total cattle population in Indonesia as reported by Directorate General of Livestock and Animal Health Services (2017). National and Local Governments have therefore attempted to expand cattle fattening in areas such as Tuban and Lamongan (LSA East Java Province 2015 pers. comm., 3 July 2015 and Priyanti et al. (2012a)).

5.1.1. Geographic and Climatic Conditions

The Tuban District has a total land area of 1,978 km^2 separated into 20 sub-districts (BPS Jawa Timur 2015). The District is located in the north of East Java, about 100 km from Surabaya, the capital city. This part of Java island is bordered by Central Java Provinces in the West, Lamongan District in the East, Bojonegoro District in the South and Java Sea in the North (Figure 5-1). The research sites in Tuban District cover 12 sub–districts of which five Palang, Jenu, Kerek, Merak Urak, and Plumpang, were involved in fieldwork.

Lamongan District also located in the north of East Java, closer to Surabaya (about 45 km) and 58 km from Tuban to the West of Lamongan. North of Lamongan lies the Java Sea, while the Gresik District is in the East (Figure 5-2). The research sites in Lamongan District cover seven sub-districts namely Kedungpring, Tikung, Kembangbahu, Sugio, Sarirejo, Pucuk and Sukadadi.

Like other areas in Indonesia, Tuban and Lamongan have two seasons, the dry season from June to October and the wet season from November to February. In 2014, the lowest rainfall (which was almost none) occurred in the months of August to October while the highest rainfall was in December and January (BPS Jawa Timur 2015).

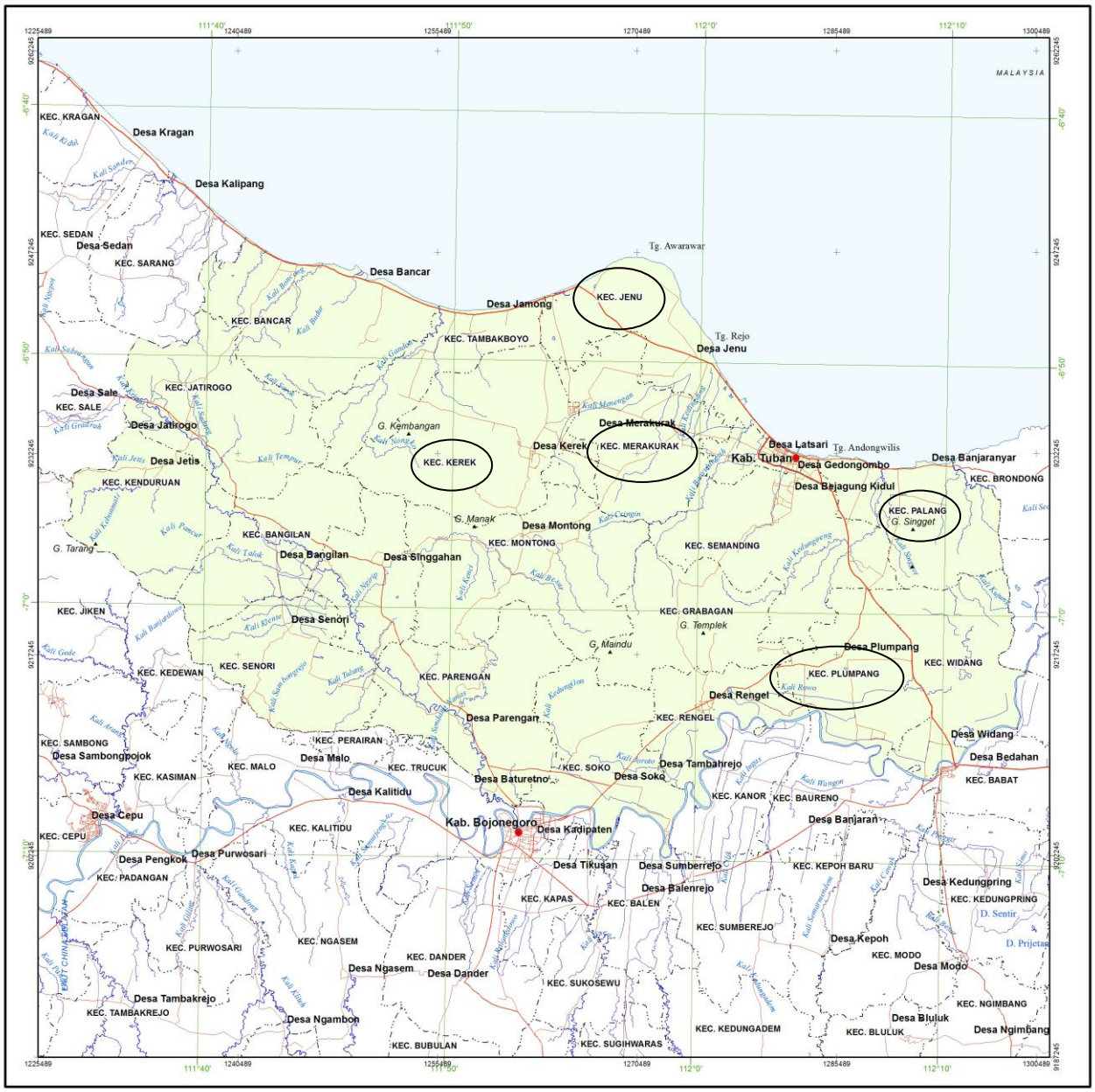


Figure 5-1. The location of research in Tuban District
Source: Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian (2016b)

Figure 5-2. The location of research in Lamongan District
Source: Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian (2016a)

5.1.2. Agriculture in East Java

Agriculture is an important economic sector in East Java, which contributes 13% to Provincial GDP (BPS Jawa Timur 2015). The agricultural sector includes food crops (paddy rice, maize, soybean, bean, cassava etc.), livestock (such as cattle, pigs, and poultry), fisheries, and estates (such as coffee and sugarcane).

Generally, most fields in East Java including those in Tuban and Lamongan are planted to rice (93%), with other crops (7%) and less than 0.1% of the area not planted at

all (fallow). Beef cattle kept in Tuban and Lomongan are about seven and two percent respectively of the total cattle population of East Java cattle.

While there are seasonal variations, there are usually three crops grown each year in both Tuban and Lamongan. For both sites, rice and maize are grown in irrigated paddy fields or dryland from October to January, followed by the same crops (maize and rice), as well as peanuts from February to May. The third crop from June to September could be rice or peanut or leaving the rice field fallow due to low rainfall (Table 5-1).

Table 5-1. The series of food crops cultivated in Tuban and Lamongan Districts

Cropping periods	Paddy field	Dry land
1. October-January	Rice/Maize	Maize/Rice
2. February – May	Rice/Maize	Maize/Peanut/Rice
3. June-September	Rice/Peanut/Fallow	Fallow

5.2. The CCO vs Cattle Fattening

While the thesis focuses on cattle fattening, an understanding of CCOs is also relevant. The overall aim of this section is to illustrate the transition between the two types of cattle production in East Java. This includes a review of the factors that drive farmers to change the type of cattle production they participate in and contributes to a better understanding of farmers' motivation to undertake cattle fattening and how this may influence demand for finance.

5.2.1. The Transition from CCO into Cattle Fattening

Most farmers are engaged in both CCO and fattening, but in different proportions. This section describes a continuum of enterprise types from farmers being focused mainly on CCO to those engaged almost entirely in cattle fattening.

Most farmers in Indonesia, especially in East Java, start cattle production in accordance with the broader farming system. Previously, cattle mainly female cattle (70%) were used as draught animals (Masum et al. 1993)[1], but were replaced with agricultural mechanisation. Farmers prefered female cattle as the price of female cattle tends to be lower than male cattle (a difference of about IDR500,000-700,000 for Ongole cross-bred cattle (PO); and IDR1-2 million for European crossbreeds) (Mahendri et al. 2010). Moreover, female cattle are more easily managed and can produce calves (Masum et al. 1993). In addition, farmers feed female cattle on lower levels of nutrition than males used

[1] The study in Eastern Uganda reported that no female cattlewere used for plowing (Okello et al. 2015).

for draught or fattening, even though under-nutrition of females reduces reproduction (delayed puberty, long calving intervals, and increased mortalities), and slows calf growth.

At the start of transitioning along the continuum, most farmers expand their CCO into fattening when their cows produce male calves, but usually retain a base in cow-calf production. Survey results from this study show that about 17% of farmers choose cattle fattening as an addition/supplement to CCO. These households do not require finance to purchase feeder cattle, as they source them from their own herds.

While this is the predominant production system relevant to fattening, a small proportion of farmers move into cattle fattening with money earned from cropping and non-farm activities. These farmers are interested in the faster profit earned from fattening male cattle. These households keep their CCO but increase their scale of production and exposure to fattening by buying male feeder cattle. If problems arise in their cattle fattening operations, they can still generate income from their main cattle enterprise (CCO). CCO is also used as a source of savings for the future. They believe that investing money in cows that produce a calf (hopefully every year) gives a greater return than bank savings[2]. This may be explained by a feeling of insecurity or lack of confidence in the banking system; the convenience of seeing their wealth; and perception that cash from cattle sales is easier to handle than the banking system. This is different to cattle fattening, which is used for short term cash generation.

Other farmers have also transitioned from CCO but still raise female cattle, mainly to utilise all their own-produced and usually lower-valued feed. Farmers in this study (about 2%) also use left-over feed from fattening male cattle, that would otherwise be wasted or composted, for their female cattle.

At the end of the continuum, some farmers have replaced their CCO with cattle fattening. In this case, they do not want to increase their scale of production beyond their limited resources (for example, pen, land, or labour). With a limit of 2-3 head of cattle, the farmers choose to specialise in fattening male cattle to generate cash returns relatively quickly. These specialised fatteners focus their resources on achieving growth and profitability from cattle fattening.

While most farmers develop their cattle fattening enterprise from a CCO, there are also farmers who begin their cattle production in specialised cattle fattening without that experience. These farmers usually keep cattle for profit, not as an addition to their farming

activities. For example, farmers in Plumpang Sub-District, Tuban District, have been involved in cattle fattening for 10 years without previous experience in CCOs.

5.2.2. Factors Influencing the Transition

There are several factors that influence the position of farmers on the continuum from CCO to cattle fattening such as the profitability of cattle fattening, problems associated with CCOs, the demand for finished cattle, and access to credit.

While the profitability of CCOs has not been assessed in this thesis, some observations can be made. First, CCOs are usually managed traditionally, so might be combined with cattle fattening to take advantage of the calves produced (Winarso 2015). Second, there are differences in the economics of CCO and fattening. Costs in the former case are usually incurred as labour and opportunity costs and, as mentioned previously, cattle play a major role in household savings. Cattle fattening is a more commercial activity where a high proportion of costs are paid in cash at the beginning of the feeding period (Hadi & Ilham 2002). Third, cattle fattening is an activity with faster turnover of product (cattle) and cash. Farmers buy feeder cattle and fatten them for 3-6 months before generating a profit from selling finished cattle. They can then use the money to finance the next fattening period. The exception is farmers who produce their own calves and therefore need more time to grow and fatten cattle. The long period of time at the CCO stage affects lower profit (Adinata et al. 2012).

Inefficiency in the production of calves in East Java also influences the transition into cattle fattening. Breeding and reproduction in cattle is not straightforward and farmers need to undertake good farming practices to operate efficiently. Cows need to have an adequate level of nutrition and body condition to go into oestrus (Affandhy et al. 2014), which farmers must have the skills to monitor and detect. Breeding is achieved through AI in East Java, requiring the service has to be delivered while the cow is cycling. Once the number of AI visits needed is more than twice, the long production period will impact on returns. As the production period is extended, the farmers bear greater risks, due to changes in input and output values (Sugiarto et al. 2014), including the high cost of AI itself (around IDR50,000).

[2] Sugiarto et al. (2014) reported that profit from CCO earned by farmers in Banjarnegara district, Central Java reached about IDR291,000 per months for 2 cows (the investment is about IDR24.2 million), and return on investment is about 14%, higher than the interest rate from a bank (5% per year)

Another factor that motivates farmers to change their cattle production system and enter into cattle fattening relates to religious practices. Eid al-Adha is an Islamic ceremony celebrated in Indonesia where many Islamic followers buy cattle for sacrifice, so the demand for finished cattle is high at that time. Prices can be two or three times higher than the normal price depending on the physical appearance of the cattle. Most farmers, particularly in Lamongan District, respond by buying feeder cattle in April or July so they can turn off slaughtered cattle in September for Eid al-Adha. However, most of these speculative farmers do not remain engaged in cattle fattening over the full year and outside of this fattening season will revert to CCOs.

Finally, 3% of farmers reported access to credit also influences the change from CCO into cattle fattening. Program credit, which is subsidised by Government (especially KKPE and KUR) is available for three years for cattle fattening with a repayment cycle of 4-6 months. Other types of bank loans (such as PMI) have specific terms that are relatively short (for example 6 months to one year) which is more suited to cattle fattening than CCOs where successful impregnation and calf maturity to slaughter weight can be years rather than months.

5.3. The Structure of Fattening Operation

This section reviews the structure of cattle fattening enterprises in the research sites, recording household's types, scales of production, inputs used, and marketing systems. This will assist in identifying ways to develop cattle fattening by households in these areas.

5.3.1. Typology of Cattle Fattening Households in East Java

Several characteristics including type of cattle production, ability to access credit, the status of the cattle, occupation of farmers, and the scale of cattle production allow this study to determine the types of households in East Java with cattle. Figure 5-3 demonstrates the survey results based on these key characteristics.

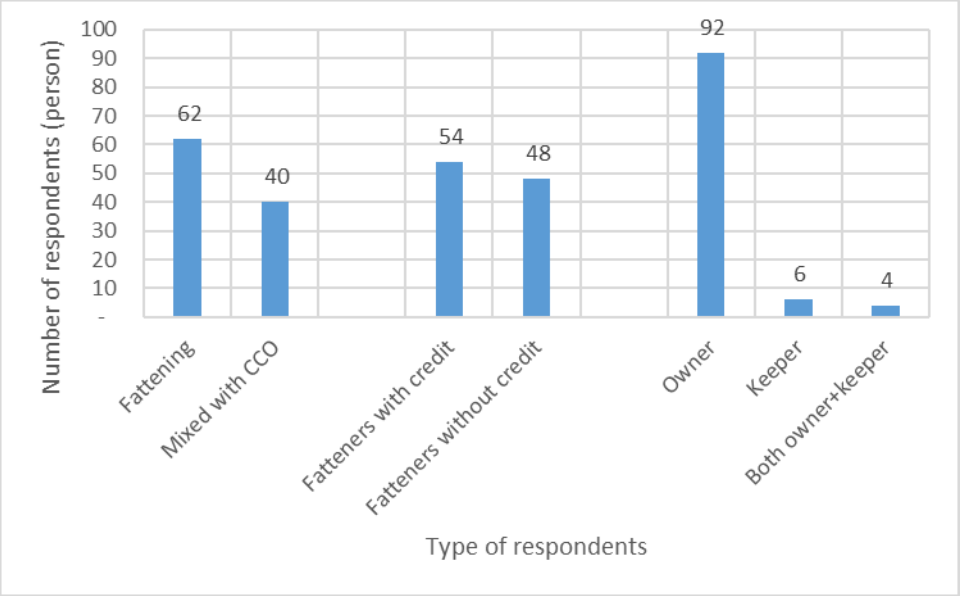


Figure 5-3. The number of households in Tuban and Lamongan Districts with various types of cattle enterprise

Survey results show the distribution of the two cattle production systems, namely specialised cattle fattening households (61%) and mixed fattening with CCOs (39%) in the study area. These farmers reported substantial experience with an average of 14 years in cattle fattening. Farmers usually start in the cattle industry through CCOs before moving into cattle fattening (Section 5.2). Households interviewed in this study were grouped into those with experience of obtaining credit (54 households) and those who had not accessed credit (48 households). However, the proportion of fatteners obtaining credit varies from area to area. To illustrate the differences in financial penetration, only eight percent of households interviewed in Palang sub-district had obtained loans, while in Jenu Sub-district about 80% have or had obtained loans. Although a low proportion of farmers in Jenu are involved in cattle fattening, the fattening group had accessed credit.

Farmers can also be distinguished by the ownership of cattle. Most farmers (about 90%) own their own cattle while six percent of farmers raise other farmer's cattle. The remaining farmers keep both their own cattle and the cattle of other households. In contrast, more than fifty percent of farmers in Magelang District, Central Java province keep other people's cattle (Yuwono et al. 2011), demonstrating that farmers with limited capital raise cattle belonging to others (Kalangi et al. 2014). This implies that households in Tuban and Lamongan are relatively wealthy or independent because most of them can buy and own their own cattle.

In terms of the main occupation, most households (60%) are farmers, predominantly in food crops. Only four percent of farmers list their main occupation as cattle fatteners

while six percent are traders. This is consistent with findings of Perdana (2003) that most cattle fatteners in Bandung, West Java rely on cropping as their main income sourse and only 27% listed livestock as their main source of income. However, 36% of households have their main occupation outside farming (Table 5-2). Cattle fattening is an important secondary source of income for 67% of households, where they keep cattle as savings or to support their farming activities. Based on the interviews undertaken, households commonly use the profits from farming activities to buy farming inputs and buy cattle.

Table 5-2. Primary and secondary occupations of respondents

No	Type of occupation	Number of respondents	Percentage of respondents
	Primary occupation		
1.	Farmer	61	59.3
2.	Cattle Fattener	5	4.4
3.	Cattle trader & trader of other commodities (unhulled rice, poultry, others)	6	5.9
4.	Labourer (rice mill, farm worker, construction worker, other manual work)	3	2.9
5.	Teacher, government officer, village administration staff, other professional occupation	15	14.7
6.	Private company/entrepreneur/hospital	13	12.7
	Secondary occupation		
7.	Farmer	13	12.3
8.	Cattle Fattener	69	67.2
9.	Cattle trader & trader of other commodities (unhulled rice, poultry, others)	7	6.4
10.	Labourer (rice mill, farm worker, construction worker, other manual work)	10	9.3
11.	Teacher, government officer, village administration staff, other professional occupation	1	1.0
12.	Private company/entrepreneur/hospital	4	3.9
	Total	102	100

Note: 1 person with two primary occupation and two people gave two answers for secondary occupation

These findings confirm to perceptions of respondents about the importance of farming, cattle fattening and other farm activities in terms of land use, income, self-consumption and the use of labour and capital resources (Table 5-3). Most households (about 82-87%) state that cropping is the most important household activity, while only 12 to 17% of respondents said that fattening cattle is the most important farming activity. Respondents who put fattening cattle as the most important activity are likely to be large scale in both fattening and cow-calf enterprises.

Table 5-3. The importance of cattle fattening in context with other farming activities

Activities	In terms of			
	The use of land	The income received	The self-consumption	The use of resources
Farming system				
Number of Respondents	87	82	88	84
Percentage of respondents	85.3	80.4	86.3	82.4
Fattening				
Number of Respondents	12	17	12	16
Percentage of respondents	11.8	16.7	11.8	15.7
Other farming activities				
Number of Respondents	3	3	2	2
Percentage of respondents	2.9	2.9	2.0	2.0

Finally, the households are also classified into three groups based on the number of cattle owned which were 1-5 head (small fatteners); 6-20 head (medium fatteners); and more than 20 heads cattle (large fatteners).

5.3.2. The Scale of Cattle Fattening Businesses in East Java

Cattle fattening operations in East Java are small scale, dominated by farmers who fatten fewer than five head of cattle. Survey results show that the average number of calves, young, or adult male cattle kept by these small fatteners were about two head per household as shown in Table 5-4. This figure is lower than the average number of cattle owned by small-holder farmers in Pasuruan, Probolinggo, and Malang which reached three to four head of cattle (Priyanti et al. 2012b). Less than nine percent of cattle fatteners are considered large-scale with an average of 27 young male cattle and 60 adult male cattle.

Table 5-4. The average number of male cattle owned by respondents

No	Herd size (head)	Average number of cattle owned (head)	Percentage of respondents
1	Adult:	7.6 (1-196)	
	1-5	2.4	78.7
	6-20	8.6	13.8
	>20	60.4	7.5
2	Young	4.8 (1-27)	
	1-5	1.7	81.8
	6-20	11.0	9.1
	>20	27.0	9.1
3	Calves	2.5 (1-7)	
	1-5	2.1	93.3
	6-20	7.00	6.7
	>20	0	0.0

Note: The numbers in brackets show the full range in the number of cattle owned

According to Figure 5-3, 39% of farmers also keep female cattle. The number of calves, young, or adult female cattle kept by farmers was about one to two head per household (Table 5-5). Less than 25% of farmers owned an average seven to ten head of cattle (either calves, young or adult male cattle). However, less than eight percent farmers were a larger scale of farmers keeping an average of 48 head of adult cattle.

Table 5-5. The average number of female cattle owned by respondents

No	Herd size (head)	Average number of cattle owned (head)	Percentage of respondents
1	Adult	6.3 (1-88)	
	1-5	1.9	79.5
	6-20	8.6	12.8
	>20	47.7	7.7
2	Young	3.5 (1-10)	
	1-5	1.3	75
	6-20	10	25
	>20	0	0
3	Calves	2.6 (1-8)	
	1-5	1.4	80
	6-20	7.5	20
	>20	0	0

5.3.3. Input Requirements for Cattle Fattening

As mentioned previously, cattle fattening requires more intensive use of inputs including feeder cattle, feed, veterinary products and infrastructure such as pens than other parts of the industry. This sub-section describes thee inputs used by farmers in Tuban and Lamongan.

Feeder cattle

The preferences for feeder cattle can be based on breed, performance, and price. The breed of cattle kept varies, with farmers normally raising crossbred cattle (Limousin, Simmental, Brahman crossbred). However, cattle fattening households often keep local cattle breeds to supply religious festivals such as Eid al-Adha (see Section 5.2.2.). This is consistent with data from West Java (Perdana 2003). Local cattle breeds have a lower body weight making them more affordable for buyers on a per head basis.

There are a number of reasons why farmers choose to keep crossbred cattle. Firstly, 50% of farmers considered crossbred cattle grow faster compared to local breeds. Secondly, the price of crossbred cattle in the market is higher than local breed cattle and they also gain more body weight. Hadi and Ilham (2000) reported that Friesian and Simmental cattle fattened in Wonosobo District, Central Java returned more profit than the

Ongole crossbred (PO). It is also becoming difficult to source local feeder cattle (especially POs) in East Java. Farmers usually get local feeder cattle (mostly Bali cattle) from Madura, Bali, or East or West Nusa Tenggara. The results highlight the fact that crossbred cattle are easier to adapt and have more meat, so the profit will be higher.

This confirms that farmers try to select cattle that maximise profits based on the variables of price and growth potential. Growth potential may be related to breed (and suitability to feed supply), animal health, and some people think the condition of the animal's feet. Skilled households often seek out cattle that may look poor or be thin (so low live weight and price) but with a large skeleton, and good growth potential, or which may gain weight quickly from "compensatory growth".

Feed

Feed is the most important input in cattle production. The main feed source in the research sites is natural grass and crop by-products such as rice straw, peanut straw, and others shown in Table 5-6. More than 76% of surveyed farmers feed their cattle daily, with a mixed ration of rice straw, rice bran, molasses and salt. However, 79% of farmers and 42% of farmers irregularly supplement this daily ration with natural grass and elephant grass respectively. Peanut, maize or soybean straw is also fed in the dry season depending on availability. Some farmers may mill the soybean and peanut straw to increase digestibility for cattle.

Table 5-6. Feed for fattening cattle by percentage of respondents

Type of feed	Number of respondents	Percentage of respondents (%)
Natural grass	81	79.4
Elephant grass	43	42.2
Rice straw	94	92.2
Maize straw	16	15.7
Peanut straw	18	17.6
Soybean straw	15	14.7
Rice bran	86	84.3
Concentrate	38	37.3
Mineral (molasses)	41	40.2
Tofu	15	14.7
Salt	77	75.5

The amount and type of feed fed to cattle varies according to the size of th animals and its availability. In general, farmers feed their cattle *ad libitum* with approximately 13 kg of natural grass (Table 5-7). Most farmers (88%) collect natural grass from public areas or their own rice fields. The number of hours spent collecting grass depends on the number of cattle, the season, and the distance of grass resources from their pens. In general,

farmers take one to two hours to collect grass per collection. If they are fattening more than two cattle, they must collect grass twice per day. During the dry season, these times are extended due to the need to cover greater distances to source adequate grass. A very small proportion (1%) of farmers purchase natural grass for their cattle. These are usually large-scale farmers who need a large volume of natural grass.

Table 5-7. Average amount of feed given to cattle, price, and source of feed

Type of feed	Average (kg/day/head)	Price (IDR/kg)	Source of feed	Percentage of respondents
Natural grass	13.4	104	Buy	1.2
			Own land	2.4
			Other farmer's land/public area	8.5
			Own land + public area	87.8
Elephant grass	7.4	625	Own land	76.2
			Other farmer's land/public area	7.1
			Own land + public area	16.7
Rice straw	7.8	375	Buy	5.3
			Own land	3.2
			Other farmer's land/public area	6.4
			Own land + other farmer's land	59.6
Maize straw	5.6	300	Buy	9.4
			Own land	53.1
			Other farmer's land/public area	37.5
Peanut straw	3.3	1,000	Own land	66.7
			Other farmer's land/public area	33.3
Soybean straw	6.8	700	Buy	8.9
			Own land	48.9
			Other farmer's land/public area	42.2
Rice bran	4.4	2,139	Buy	96.4
			Own land	3.6
Concentrate	7.2	2,000	Buy	23.7
			Home made	42.1
			Dinas/group	34.2
Mineral/ molasses	0.3	7,000	Buy	100
Tofu	3.4	1,977	Buy	93.3
			Home made	6.7
Salt	0.2	880	Buy	100

Farmers may substitute rice straw for native grass up to 8kg per head per day (Table 5-7) during the dry season or when farm activities restrict capacity to collect grass. As a sustainable forage resource, especially in Java Island (Abdullah 2010), rice straw is collected from various supplies. Some farmers collect rice straw from their own land (3%) or from other farms (6%), however, most farmers (60%) source it from a combination of those two (Table 5-7). Hanifah et al. (2010b) also reported that 74 and 80% of farmers in Pasuruan and Malang collect rice straw from their own or from other farmers' fields either as part of a group or by themselves. Farmers commonly help each other to harvest their paddy and in return get the rice straw from that land as reported by Winarto et al. (2000). Farmers may also share the cost of a truck to collect rice straw from other farmers. Only a small proportion of farmers (14%) bought rice straw from feed traders to be either delivered or collected. Rice straw purchases are most common by farmers with large numbers of cattle, or by traders who also fatten cattle and have less time to collect rice straw.

Elephant grass is an especially important cattle feed in the dry season. It is not grown on dedicated land but in the farmyard, on rice field terraces, or on dryland not utilised for crops. Elephant grass is only given to cattle every two weeks because it cannot be harvested every day. Hanifah et al. (2010b) suggests that 25% of farmers in Probolinggo and 57% of farmers in Malang planted elephant grass on their land.

Farmers commonly feed four kilograms of a mixed ration which consists of rice bran, a small amount of salt and molasses added to the cattle's water (known as Ngombor). The large quantity of rice bran in the diet is somewhat lower than the 5kg/day/head reported by Bank Indonesia (2013b) from Lamongan. This may have been because farmers were preparing cattle for Eid al-Adha at the time; or they might have been higher body weight cattle that have higher capacity to consume feed (Adiwinarti et al. 2014). Households usually feed *ngombor* two or three times a day and the amount of rice bran varies depending on its availability and price, which varies by season. During paddy harvest, farmers feed their cattle more rice bran about 6 kg/head/day, as prices are relatively low. Prices for rice bran can be as low as IDR1,000/kg in harvest season, but can increase to IDR3,000/kg out of season.

A significant proportion (37%) of cattle fatteners surveyed in Tuban and Lamongan feed a complete commercial feed or purchased grain (known as concentrate) to their fattening cattle (Table 5-6). The average amount of concentrate fed is 7 kg/head/day (Table 5-7), although there were several limiting factors to its use. Concentrate is expensive, up to IDR3,000/kg outside harvest time (reported by 33% farmers). It can also

be difficult to buy the concentrate (26% farmers) and so other sources of feed such as rice bran can be used to replace it (41% farmers).

Nearly half of the farmers (42%) make their own concentrate using by-products such as copra, peanut skin, palm oil cake, coffee bean skin, molasses and rice bran. LSA provides advice to farmers on ration formulas. In addition to home-produced concentrates, about 34% of farmers obtain concentrate from LSA Lamongan District which has a program to introduce and distribute concentrate, at about 10 kg/head/day. Just 24% farmers buy concentrate from the market.

Labour

As in other cattle production systems, the source of labour for cattle fattening in Tuban and Lamongan involves family labour including husband, wife and children. Yuwono et al. (2011) reported that one to six family members could be involved in feed collection and cattle management. Results suggest that 89% of household labour is committed to cattle fattening on a part time basis, of which 66% is male labour (Table 5-8). Of the households surveyed, 89% had one male labourer who spent three to four hours a day feeding cattle three times a day (in the morning, afternoon, and at night). Some wives (33%) also help their husbands to feed cattle and clean the pens while their husband collects or prepares feed.

About 11% of farmers use non-family labour, both full-time (69%) and part-time (31%). Medium- to large-scale cattle fatteners usually hire one to two non-family labourers to work in their cattle enterprise. However, the labourer's job is not exclusively cattle feeding and may include other farming activities such as rice processing or cattle trading, if their employer is a cattle trader. The average labour cost is IDR50,000 per day or IDR25,000 per half day.

Table 5-8. Labour inputs for cattle fattening in Tuban and Lamongan Districts

No	Types of labour	Number of labourers	Number of respondents	Percentage of respondents
A.	**Family Labour**		**134**	**89.3**
1	*Fulltime family labour*		*0*	*0.0*
	a. Male	0	0	0
	b. Female	0	0	0
	c. Children	0	0	0
2	*Part time family labour*		*134*	*100*
	a. Male		88	65.7
		1	78	88.6
		≥2	10	11.4
	b. Female	1	44	32.8
	c. Children	1	2	1.5
B.	**Non-family labour**		**16**	**10.7**
3	*Fulltime non-family labour*		*11*	*68.8*
	a. Male		11	100
		1	4	36.4
		2	3	27.4
		≥2	5	45.5
	b. Female	0	0	0
	c. Children	0	0	0
4	*Part time non-family labour*		*5.0*	*31.3*
	a. Male		5	100.0
		1.0	4	80.0
		2.0	1	20.0
	b. Female	0	0	0
	c. Children	0	0	0

Pens

Cattle fatteners use either individual pens or group pens. Most farmers (91%) use individual pens for their cattle, while a small number (11%) pen cattle in group pens, which can be managed collectively, or individually. Yuwono et al. (2011) reported that only 38% of members of a farmers' group in Magelang District, Central Java put their cattle in communal pens.

Most pens are standardised with stalls for each animal, concrete floor, concrete troughs for feed and water; and roof (Figure 5-4 left). Only 30% of farmers have "traditional" pens made from wood, where feed is placed on the ground (Figure 5-4 right). Farmers who get credit from banks usually build standard pens but this may depend on the type of credit obtained as it can sometimes be a requirement of the application.

Figure 5-4. Pens used for housing cattle in Tuban and Lamongan Districts - standard pens on the left, and traditional pens on the right

Veterinary

Farmers in Tuban and Lamongan are concerned with cattle health, particularly for anthelmintic (parasite) issues, vitamins, and veterinary care. Almost 80% of farmers give their cattle anthelmintic tablets (Table 5-9) at IDR10,000 per tablet. One tablet is given every one to three months. Farmers (34%) also give vitamins, while 18% contacted veterinarians to check their cattle. Aryandrie et al. (2015) reported that only 55% of farmers in Pringsewu Regency, Lampung Province treated their cattle for animal health problems. The low treatment rate in East Java may be because of low incidence of animal health problems or the significant cost of about IDR40,000 to 60,000 per visit. According to interviewed farmers, some farmers give their cattle traditional medicine (jamu) for some health ailments. An example is to mix fried lamtoro seeds with salt and water (for worms), or crushed garlic with salt and water (for bloating).

Table 5-9. Types of veterinary treatment

Types of health treatment	Number of respondents	Percentage of respondents
Vitamins	35	34.3
Anthelmintic	81	79.4
Veterinary services	18	17.7

5.3.4. Cattle Marketing

Farmers obtain feeder cattle from the live cattle markets (67%); traders (17%); their own CCOs (9%); and mixed sellers (8%) (Table 5-10). There are numerous live

cattle markets around Tuban and Lamongan, including Tuban, Lamongan, Jatirogo, Bojonegoro, Pucuk, Jombang, Babat, Pule, and Gresik. Most farmers who buy cattle from these markets have access to market information such as prices and know the buyers and sellers. Some farmers buy feeder cattle outside the markets, directly from traders who usually live close by and have a good relationship with them.

Table 5-10. Sources of feeder cattle for fattening

No	Source of feeder cattle	Number of respondents	Percentage of respondents
1.	Live cattle market/cooperative	68	66.7
2.	Traders (village, district, sub-district, provinces) and other farmers	17	16.7
3.	Own herd of cattle	9	8.8
4.	Others (broker, mixed own herd, other farmers, traders and market)	8	7.8

In contrast, when farmers sell fattened/finished cattle, 94% sell at home, where the buyer approaches the seller. Only six percent of farmers sell their cattle away from their house. There are a range of reasons for these selling preferences including negotiating position, transport costs, and the costs and risks of not selling cattle at the market. Buyers operating at farmer's houses are mostly village traders and brokers while there are also some butchers (Table 5-11). Similar results were and reported by Fauzi and Djajanegara (2004); Mahendri et al. (2010); Patrick et al. (2010); Mahendri et al. (2012) where farmers sold cattle to village traders.

Table 5-11. Types of cattle buyers

Types of buyer	Number of respondents	Percentage of farmers
Village traders	52	51.0
Other farmers	5	4.9
Butchers	25	24.5
Whoever gives higher price	9	8.8
Cooperative	7	6.9
Sub district & district traders	4	3.9

5.4. Budget Analysis of Cattle Fattening

This section provides a budget analysis of representative cattle fattening households in study sites in East Java. Cashflow analysis and full budget analysis that includes opportunity costs were conducted. The aim was to establish the viability

and profitability of cattle fattening and identify incentives for both banks and households to enter into credit arrangements.

5.4.1. Parameter Input vs Output

Budget analysis in this section is based on survey data from respondents in Lamongan and Tuban. Due to the different characteristics of cattle fatteners, differences are explored across the classifications outlined in Section 5.3.1., namely: small farmers (who have less than six head of cattle); medium-sized farmers (who have 6-20 head); and large farmers (who have more than 20 head of cattle). A distinction is also made between farmers who were and who were not able to access credit. The results of both cashflow and full budget analysis are shown in Table 5-12 and Table 5-13, respectively.

Table 5-12. Cashflow analysis of representative cattle fattening farms

No	Parameters	Credit			No-Credit	
		Small farmers	Medium farmers	Large farmers	Small farmers	Medium farmers
	Number of days in fattening period	180	180	180	240	240
	Number of cattle fattened (head)	3	9	60	2	6
A	**Revenue**					
1	Finished cattle sold (IDR)	62,467,470	199,566,783	1,347,115,740	40,669,018	126,000,000
2	Manure revenue (IDR)	-	-	-	-	-
3	Biogas revenue (IDR)	-	-	-	-	-
	Total revenue	62,467,470	199,566,783	1,347,115,740	40,669,018	126,000,000
B	**Non-Capital Costs**					
1	Feeder cattle (IDR)	46,584,000	157,257,000	1,056,870,000	29,095,000	84,249,000
2	Labour (IDR)	-	5,920,020	20,742,840	-	10,800,000
3	Veterinary services (IDR)	366,000	1,098,000	7,320,000	284,000	852,000
4	Feed (IDR)	5,282,280	23,642,280	148,150,080	5,182,032	7,788,528
5	Manure (IDR)	-	-	-	-	-
6	Depreciation of pens (IDR/year)	-	-	-	-	-
7	Other costs (IDR)	170,000	470,000	3,020,000	120,000	320,000
	Communication (IDR)	20,000	20,000	20,000	20,000	20,000
	Transportation (IDR)	150,000	450,000	3,000,000	100,000	300,000
	Total non-capital costs	52,402,280	188,387,300	1,236,102,920	34,681,032	104,009,528
C	**Gross profit per fattening period**	10,065,190	11,179,483	111,012,820	5,987,986	21,990,472
	Gross profit per head per day	18,639	6,901	10,279	12,475	15,271
	Gross profit per day	55,918	62,108	616,738	24,950	91,627
D	**Capital Costs**					
1	Interest for fattening period (IDR)	1,500,000	1,500,000	1,500,000	-	-
2	Application cost (IDR)	425,000	395,000	385,000	-	-
3	Opportunity cost of own capital (IDR)	-	-	-	-	-

	Total capital costs	1,925,000	1,895,000	1,885,000	-	-
E	**Net profit per fattening period**	8,140,190	9,284,483	109,127,820	5,987,986	21,990,472
	Net profit per head per day	15,074	5,731	10,104	12,475	15,271
	Net profit per day	45,223	51,580	606,266	24,950	91,627

Table 5-13. Full budget analysis for representative fattening farms

No	Parameters	Credit			Non-Credit	
		Small farmers	Medium farmers	Large farmers	Small farmers	Medium farmers
	Number of days in fattening period	180	180	180	240	240
	Number of cattle fattened (head)	3	9	60	2	6
A	**Revenue**					
1	Finished cattle sold (IDR)	62,467,470	199,566,783	1,347,115,740	40,669,018	126,000,000
2	Manure revenue (IDR)	432,000	1,296,000	8,640,000	384,000	1,152,000
3	Biogas revenue (IDR)	-	-	-	-	-
	Total revenue	62,899,470	200,862,783	1,355,755,740	41,053,018	127,152,000
B	**Non-Capital Costs**					
1	Feeder cattle (IDR)	46,584,000	157,257,000	1,056,870,000	29,095,000	84,249,000
2	Labour (IDR)	9,000,000	11,840,040	31,114,260	12,000,000	21,600,000
3	Veterinary services (IDR)	366,000	1,098,000	7,320,000	284,000	852,000
4	Feed (IDR)	7,775,280	27,904,905	164,822,580	8,471,032	7,923,528
5	Manure (IDR)	60,000	180,000	1,290,000	60,000	180,000
6	Depreciation of pens (IDR/year)	391,600	1,060,147	1,656,250	600,877	1,133,333
7	Other costs (IDR)	170,000	470,000	3,020,000	120,000	320,000
	Communication (IDR)	20,000	20,000	20,000	20,000	20,000
	Transportation (IDR)	150,000	450,000	3,000,000	100,000	300,000
	Total non-capital costs	64,346,880	199,810,092	1,266,093,090	50,630,909	116,257,861

C	**Gross profit per fattening period**	-1,447,410	1,052,691	89,662,650	-9,577,891	10,894,139
	Gross profit per head per day	-2,680	650	8,302	-19,954	7,565
	Gross profit per day	-8,041	5,848	498,126	-39,908	45,392
D	**Capital Costs**					
1	Interest for fattening period (IDR)	1,500,000	1,500,000	1,500,000	-	-
2	Application cost (IDR)	425,000	395,000	385,000	-	-
3	Opportunity cost of own capital (IDR)	1,367,499.89	4,246,364.08	26,907,010.35	1,434,677.43	3,294,282.76
	Total capital costs	3,292,500	6,141,364	28,792,010	1,434,677	3,294,283
E	**Net profit per fattening period**	-4,739,910	-5,088,673	60,870,640	-11,012,568	7,599,856
	Net profit per head per day	-8,778	-3,141	5,636	-22,943	5,278
	Net profit per day	-26,333	-28,270	338,170	-45,886	31,666

Feeder cattle costs

The number of cattle held by farmers varies by category. Small farmers with access to credit have about three head on average while small farmers without access to credit have an average of about two head. Similarly, medium-sized farmers with credit fatten about nine cattle per period, more than medium farmers without credit who have about six head. No large farmers without credit were found in the surveys, while large farmers with credit keep about 60 head of cattle on average.

Most farmers buy cattle from a local market where prices are negotiated and transacted on a per head basis, not per kg body weight. Generally, in 2017 the price of feeder cattle in the market was about IDR50,000-51,000/kg for cattle with live weight less than 350 kg; and about IDR48,000-49,000 per kg for cattle over 350 kg. In this analysis, it is assumed that the price of cattle in the market is IDR50,000 per kg as the average live weight of cattle in the survey was about 300 kg. Thus, the average price of feeder cattle is about IDR14-17 million with body weight in the range 280-349 kg (Table 5-14).

Table 5-14. The price and initial body weight of feeder cattle for each farmer

No	Type of farmers	Price of cattle (IDR per head)	Average body weight of cattle (kg)
	With credit		
1.	Small farmers	15,527,957	311
2.	Medium-size farmers	17,472,770	349
3.	Large farmers	17,614,583	352
	Without credit		
1.	Small farmers	14,547,292	291
2.	Medium-size farmers	14,041,667	281

Finished cattle revenues

Farmers with credit feed their cattle for 180 days, which is also the average period to borrow funds. Farmers without credit keep cattle for 240 days because of the lower weight and longer period to reach the assumed sales weight.

As discussed in Section 5.3.4, finished cattle are usually sold independently in their pens to traders. Cattle are also sold on an estimated live weight basis head which equates to price of about IDR43,000-45,000 per kg, depending on the size, and health of the cattle. An average sales price of IDR44,000 is assumed. Based on survey results, the average revenue for finished cattle sold to traders is about IDR20-22 million per head with the average final weight between 462-510 kg after an average daily gain (ADG) 0.8 kg/day (Table 5-15).

Table 5-15. Price, body weight, and ADG of finished cattle for each farmer category

No	Type of farmers	Price of cattle (IDR/head)	Average body weight of cattle (kg)	ADG (kg per day)
	Farmers with credit			
1.	Small farmers	20,822,490	504	0.9
2.	Medium-sized farmers	22,174,087	510	0.9
3.	Larger farmers	22,451,929	462	0.9
	Farmers without credit			
1.	Small farmers	20,334,509	477	0.7
2.	Medium-sized farmers	21,000,000	473	0.8

Manure price

Farmers in the research areas use manure on their fields as reported by Abdullah (2010). Others utilise manure for biogas, where biogas digesters have been installed, usually through a grant. The revenue from manure sales or opportunity cost of manure is not included in the cashflow analysis because farmers do not receive cash from it, however, in a full budget analysis, it needs to be considered as revenue.

The production of manure is estimated about 10 kg/head/day as reported by Huda and Wikanta (2017). The price of manure is based on sales to a fertilizer company by a large farmer in Lamongan at a price IDR400,000 per truckload (five tonnes, semi-dry (IDR80/kg). Two people are required to load a truck at a cost of IDR30,000 per person, calculated as a cost of manure sales. Medium and large farmers who produce more manure require the same number of labourers for more times work (about six and 43 times respectively) to load manure onto trucks each fattening period.

Labour cost

Generally, the husband and wife in the family work together in this business and do not get paid, so the cost of labour is not included in cashflow analysis. However, in a full budget, the cost of labour is based on a half day of labour which costs about IDR25,000-30,000 to clean the pen, to feed the cattle etc.

Medium-sized and large farmers often hire one or two labourers respectively from outside the family at a wage of about IDR32,889 and IDR57,619. Medium farmers without credit spend IDR45,000 to pay for non-family labour.

Veterinary cost

Based on the survey data, farmers treat cattle with vitamins and anthelmintic. Vitamins are given once per fattening period, while the anthelmintic is given every month. The prices of vitamin and anthelmintic treatments is about IDR12,000 and IDR10,000,

respectively. Farmers are assumed to call the veterinary officer once per fattening period to monitor or treat their cattle. The cost of this veterinary visit is about IDR50,000. In total, so veterinary cost is significant at about IDR 592-678 per head per day.

Feed cost

As already established, cattle farmers in Tuban and Lamongan source feed predominantly from agricultural by-products consisting of natural grass, rice straw, rice bran with additional salt and molasses and sometimes elephant grass, maize straw, peanut straw and soybean straw. The amount and cost of feed given to cattle, is shown in Table 5-16.

Native grass is the common feed provided for cattle. Farmers collect native grass for free from the fields in their village and feed 13-16 kg/head/day. The labour cost of collecting native grass is estimated to be a half day of labour (around 3 hours) or IDR25,000. The amount of native grass collected is about 240 kg (4 bags x 60 kg), so the price of native grass can be calculated about IDR104 per kg. It is assumed that in one period, farmers do not only feed their cattle native grass but substitute it with rice straw (for half the period).

As established previously, rice straw is used to substitute for native grass especially in the dry season when it is difficult to source native grass. Based on survey results, most farmers collect rice straw from their farm or neighbors at no cost. In a full budget, the opportunity cost is calculated as the price offered by feed traders who sell rice straw to farmers on the basis of one load (933 kg) for IDR350,000-400,000. On this basis, the price of rice straw is estimated as IDR375 per kg.

Other feed from agricultural by-products such as maize straw, peanut straw, and soybean are not frequently given to cattle. It depends on availability after harvest. Based on the interviews with farmers who buy feed from the market, the amount and price of these feeds are presented in Table 5-16.

Farmers sometimes feed their cattle with 4-8 kg of elephant grass per day when available from their own fields. As it takes about half a day to collect 40 kg of elephant grass per day (IDR 25,000), the labour cost for the collection of elephant grass is estimated as IDR 625/kg.

Table 5-16. Cost of feed used by representative cattle fattening farms

No	Parameters	Credit			Non-Credit	
		Small farmers	Medium farmers	Large farmers	Small farmers	Medium farmers
1	Total feed cost (IDR/head/period)	2,591,760	3,100,545	2,747,043	4,235,516	1,320,588
a	Total native grass (IDR/head/period)	131,250	140,625	121,875	200,000	-
	Amount of native grass per day (kg/head)	14	15	13	16	-
	Price of native grass (IDR/kg)	104	104	104	104	104
	Number of days	90	90	90	120	120
b	Total elephant grass (IDR/head/period)	150,000	150,000	75,000	150,000	-
	Amount of elephant grass per day (kg/head)	8	8	4	8	-
	Price of elephant grass (IDR/kg)	625	625	625	625	-
	Number of days	30	30	30	30	30
c	Total rice straw (IDR/head/period)	303,750	135,000	337,500	315,000	225,000
	Amount of rice straw per day (kg/head)	9	4	10	7	5
	Price of rice straw (IDR/kg)	375	375	375	375	375
	Number of days	90	90	90	120	120
d	Total maize straw (IDR/head/period)	18,000	18,000	81,000	31,500	22,500
	Amount of maize straw per day (kg/head)	4	4	9	7	5
	Price of maize straw (IDR/kg)	300	300	300	300	300
	Number of days	15	15	30	15	15
e	Total peanut straw (IDR/head/period)	60,000	30,000	-	45,000	-
	Amount of peanut straw per day (kg/head)	4	2	-	3	-
	Price of peanut straw (IDR/kg)	1,000	1,000	-	1,000	-
	Number of days	15	15	-	15	-
f	Total soybean straw (IDR/head/period)	168,000	-	-	147,000	-
	Amount of soybean straw per day (kg/head)	8	-	-	7	-
	Price of soybean straw (IDR/kg)	700	-	-	700	-
	Number of days	30	-	30	30	-
g	Total concentrate (IDR/head/period)	-	-	-	756,000	-
	Number of concentrate per day (kg/head)	-	-	-	9	-
	Price of concentrate (IDR/kg)	-	-	-	2,000	-
	Number of days	169	116	83.00	42	120
h	Total salt (IDR/head/period)	31,680	39,600	42,768	40,128	29,568
	Quantity of salt per day (kg/head)	0.20	0.25	0.27	0.19	0.14
	Price of salt (IDR/kg)	880	880	880	880	880
	Number of days	180	180	180	240	240
i	Total molasses (IDR/head/period)	189,000	277,200	163,800	856,800	12,000
	Number of molasses per day (liter/head)	0.15	0.22	0.13	0.51	0.01
	Price of molasses (IDR/liter)	7,000	7,000	7,000	7,000.00	5,000
	Number of days	180	180	180	240.00	240
j	Total rice bran (IDR/head/period)	1,540,080	2,310,120	1,925,100	1,694,088	1,026,720
	Number of rice bran per day (kg/head)	4	6	5	4	2
	Price of rice bran (IDR/kg)	2,139	2,139	2,139	2,139	2,139
	Number of days	180	180	180	180	180

Rice bran is an important component of the diet in cattle fattening. Farmers with access to credit usually feed 4-6 kg/day of rice bran to cattle weighing more than 350 kg. Farmers without access to credit usually feed their cattle of the same weight with 2-4 kg/day of rice bran. The price of rice bran is about IDR1,850-2,500 per kg in the local market.

Pen cost

The cost of a pen is included only in the full budget with the depreciation and other average pen costs shown in Table 5-17.

Table 5-17. Pen cost

No	Parameters	Credit			Non-Credit	
		Small farmers	Medium farmers	Large farmers	Small farmers	Medium farmers
1	Depreciation (IDR/year)	783,200	2,120,294	3,312,500	901,315	1,700,000
a	Pen Cost (IDR)	7,832,000	36,045,000	66,250,000	9,914,467	17,000,000
b	Life of pen (years)	10	17	20	11	10
2	Depreciation over fattening period (IDR)	391,600	1,060,147	1,656,250	600,877	1,133,333

Financial cost

The cost of borrowed funds is based on the interest rate (6%) under program credit schemes (KKPE and the old KUR with a limit of about IDR50-100 million per farmer). In this analysis, the cost of credit is only included for the fattening period. Farmers also pay other borrowing costs including: 1) loan administration (IDR300,000); and 2) building insurance (IDR300,000 for two years). These application costs have to be paid before loans are distributed into farmers' accounts. The deposit of IDR10,000-50,000 required when opening a new bank account is not counted as a cost of obtaining credit.

In the full budget analysis, famers also incur the opportunity cost of their own capital invested over the fattening period for feed, veterinary expenses, and those other costs that cannot be paid by credit. The cost of this working capital is calculated at the interest earned on a term deposit in the bank (for example, 4.25% per year in BRI, or 0.3542% per month).

Other costs

Other costs included in this operation are transport and communication costs. The cost to transporting feeder cattle from market to the farmer's home is assumed to be IDR50,000 per head but as mentioned previously farmers do not incur transport costs in

the sale of finished cattle at the farm-gate. Communication costs (such as for calling the supplier, veterinarian, feed seller etc.) are estimated at IDR20,000 per fattening period.

Profit

Based on cashflow analysis (Table 5-12), the cash surplus per day generated by all types of farmers are positive, demonstrating that cattle fattening has a positive impact on farmers' incomes. Significantly, farmers who borrow funds to fatten cattle generated more profit than those who did not borrow. This might be because the additional money they obtained allowed them to expand their scale of production. Moreover, even though farmers who do not take a loan do not need to pay interest rate, they usually buy smaller cattle which need to be kept longer. Some other studies (Mahendri 2009; Ammani 2012; Setyari 2012; Dahri et al. 2015) also reported that program credit significantly increased the number of cattle kept by farmers. This also increased the income of farmers (Khan & Rahaman 2007; Dahri et al. 2015).

However, in the full budget analysis (Table 5-13), only larger farmers who borrowed and medium-sized farmers without credit achieved a net profit. Large farmers tend to use the inputs more efficiently. In contrast, medium-sized farmer who do not borrow fed smaller cattle, but they collectedless feed from the field so the cost of feed in a full budget is lower than for medium-sized farmers with credit.

5.4.2. Sensitivity Analysis

Sensitivity analysis is used to examine how changes in parameter values affects the viability/profitability of the enterprise. In this study, the major parameters that need to be considered are changes in interest rates, the price of feeder cattle, the price of finished cattle, ADG, and the fluctuating price of rice bran with the justification for each provided in the following paragraphs. The sensitivity analysis was only done for the case where credit was obtained.

Scenario 1: Interest rate

Interest rates are a key parameter in the context of this study. Interest payments also account for 3% of the total costs for the representative households. When the surveys were conducted, most farmers who had borrowed funds to fatten cattle received low interest rate loans (6%) from banks subsidised under various Government programs. However, the sustainability of those programs and subsidised interest rates cannot be assured. Structural changes by the current government could influence programs established previously, such as the new KUR credit program introduced with a 9% interest

rate. The following scenario examines farmers' access to bank loans at current commercial rates (about 13% at the time of study). These changes could affect net profit as presented in Table 5-18.

Table 5-18. Changes in net profit from a change in interest rate

No	Type of fatteners	Existing condition	Interest rate 9%		Interest rate 13%	
		(IDR)	(IDR)	(%)	(IDR)	(%)
	Cashflow					
1	Small farmers	15,074	13,686	(9.2)	11,834	(21.5)
2	Medium-sized farmers	5,731	5,268	(8.1)	4,651	(18.9)
3	Large farmers	10,104	10,035	(0.7)	9,942	(1.6)
	Full budget					
1	Small farmers	-8,778	-10,166	15.8	-12,018	36.9
2	Medium-sized farmers	-3,141	-3,604	14.7	-4,221	34.4
3	Large farmers	5,636	5,567	(1.2)	5,474	(2.9)

If the interest rate increases to 9 or 13%, the cash surplus of small farmers decreases by 9 and 22%, respectively. The decrease in cash surplus is lower for medium and large farmers but it is important to note that even under these higher interest rates, the cash surplus is still positive and remains a viable business for these farmers, even if all of their non-cash costs are not met. In the full budget analysis, the effect of increasing interest rates also decreases the net profit received by farmers. For medium-sized farmers, net profits decline 15 and 34% respectively, slightly lower than the changes of net profit for small farmers which are 16 and 37% respectively. Only large farmers are profitable under current credit programs (6% interest rates) and remain so under higher interest rates.

Scenario 2: Price of feeder cattle

The price of feeder cattle is also an issue in cattle fattening in Indonesia. The price of feeder cattle in local markets is relatively expensive (see price in Section 5.4.1). However, the price could increase or decrease due to market movements. This section shows the effect of changes in the price of feeder cattle on farmers' profits. An increase and decrease in the price of feeder cattle by 5% and 10% (IDR45,000 and IDR47,500 per kg) is used in this case. Table 5-19 shows an increase in the price of feeder cattle decreases the cash surplus but it is still positive except for medium-sized farmers. However, for the full budget the net profit becomes negative and subsequently unattractive for all except large farmers when the price of feeder cattle increases by 5%. An increase in the price of feeder cattle by 10% results in negative profit for all farmers.

A decrease in feeder cattle price of 5 and 10% increases the net profit except for small farmers which remains negative in the full budget when the price of feeder cattle falls 5% from the current price.

Table 5-19. Changes in profit after changes in price of feeder cattle

No	Type of fatteners	Existing condition	Increase price of feeder cattle by 5%	Increase price of feeder cattle by 10%	Reduce price of feeder cattle by 5%	Reduce price of feeder cattle by 10%
		(IDR)	(IDR)	(IDR)	(IDR)	(IDR)
	Cashflow					
1	Small farmers	15,074	10,761	6,448	19,388	23,701
			(28.6)	*(57.2)*	*28.6*	*57.2*
2	Medium-sized farmers	5,731	878	-3,976	10,585	15,438
			(84.7)	*(169.4)*	*84.7*	*169.4*
3	Large farmers	10,104	5,212	319	14,997	20,078
			(48.4)	*(96.8)*	*48.4*	*98.7*
	Full budget					
1	Small farmers	-8,778	-13,183	-17,588	-4,373	32
			50.2	*100.4*	*(50.2)*	*(100.4)*
2	Medium-sized farmers	-3,141	-8,098	-13,055	1,816	6,772
			157.8	*315.6*	*(157.8)*	*(315.6)*
3	Large farmers	5,636	639	-4,358	10,633	15,770
			(88.7)	*(177.3)*	*88.7*	*179.8*

Note: Figures in italics are percentages

Scenario 3: Price of finished cattle

Currently, the price of finished cattle (IDR44,000 per kg) in local markets is lower than the price of feeder cattle. As a result, Pacheco et al. (2014); Sugiarto et al. (2014) noted any profit comes from adding live weight to the animals that are fed and the fattening business is quite sensitive to changibg prices. This scenario tests the effects of increasing or reducing the price of finished cattle by 5 and 10%, The result of these changes in the price of finished cattle on profits is shown in Table 5-20.

If the price of finished cattle increases 10%, both the cash surplus and net profit of farmers remained positive. However, net profit received by small farmers in the full budget remains negative when the price of finished cattle increases by 5%. If the price of finished cattle is reduced by 5%, surpluses in the cashflow analysis are positive except for medium-sized farmers, and negative in the full budget for all farmers. If the price is reduced by 10% the outcome is negative in both cashflow analysis (except for small farmers) and the full budget. This business is not feasible if the price of finished cattle sold

is about IDR 39,600 per kg. In this study, the net profit is quite sensitive to the price of finished cattle, as indicated by the high percentage change in net profit.

Table 5-20. Changes in net profit from changes in the price of finished cattle

No	Type of fatteners	Existing condition	Increase price of finished cattle by 5%	Increase price of finished cattle by 10%	Reduce price of finished cattle by 5%	Reduce price of finished cattle by 10%
		(IDR)	(IDR)	(IDR)	(IDR)	(IDR)
	Cashflow					
1	Small farmers	15,074	20,858	26,642	9,290	3,506
			38.4	*76.7*	*(38.4)*	*(76.7)*
2	Medium-sized farmers	5,731	11,891	18,050	-428	-6,588
			107.5	*214.9*	*(107.5)*	*(214.9)*
3	Large farmers	10,104	16,341	22,578	3,868	-2,369
			61.7	*123.4*	*(61.7)*	*(123.4)*
	Full budget					
1	Small farmers	-8,778	-2,994	2,790	-14,562	-20,346
			(65.9)	*(131.8)*	*65.9*	*131.8*
2	Medium-sized farmers	-3,141	3,018	9,178	-9,301	-15,460
			(196.1)	*(392.2)*	*196.1*	*392.2*
3	Large farmers	5,636	11,873	18,109	-600	-6,837
			110.7	*221.3*	*(110.7)*	*(221.3)*

Note: Figures in italics are percentages

Scenario 4: Price of rice bran

Another scenario considered in this sensitivity analysis is a change in the price of rice bran. Rice bran is an important source of feed for fattening cattle especially for small farmers as its availability and price make it affordable. However, in the dry season the price of rice bran will be higher because fewer farmers grow paddy although this does not mean that rice bran is unavailable. Some farmers still keep paddy at home and process it in the rice mills and retain the rice bran.

In the following analysis four scenarios are examined; an increase and a decrease in the price of rice bran at 5 and 10%. The current price is based on the average price of rice bran recorded by farmers (IDR2,139). The effect of the changes in the price of rice bran on net profits are shown in Table 5-21.

The price change for rice bran has a lower effect on net profit, except for medium-sized farmers because these farmers use more rice bran for their cattle, compared to others. An increase in the price of rice bran (of both 5 and 10%) reduces the cash surplus but maintains a positive cashflow. Similarly, in the full budget an increase of 5 or 10% in

the price of rice bran decreases net profit for all farmers, with only large farmers maintaining their profit. A decrease in the price of rice bran results in a positive cashflow for all farmers. Profits in the full budget remains negative except for large farmers even if the price of rice bran decreases by 5 or 10%.

Table 5-21. Changes in net profit after changes in price of rice bran

No	Type of fatteners	Existing condition	Increase price of rice bran by 5%	Increase price of rice bran by 10%	Reduce price of rice bran by 5%	Reduce price of rice bran by 10%
		(IDR)	(IDR)	(IDR)	(IDR)	(IDR)
	Cashflow					
1	Small farmers	15,074	14,647	14,219	15,502	15,930
			(2.8)	*(5.7)*	*2.8*	*5.7*
2	Medium-sized farmers	5,731	5,089	4,448	6,373	7,015
			(11.2)	*(22.4)*	*11.2*	*22.4*
3	Large farmers	10,104	9,570	9,035	10,639	11,174
			(5.3)	*(10.6)*	*5.3*	*10.6*
	Full budget					
1	Small farmers	-8,778	-9,215	-9,651	-8,341	-7,904
			5.0	*10.0*	*(5.0)*	*(10.0)*
2	Medium-sized farmers	-3,141	-3,796	-4,452	-2,486	-1,830
			20.9	*41.7*	*(20.9)*	*(41.7)*
3	Large farmers	5,636	5,090	4,544	6,182	6,728
			(9.7)	*(19.4)*	*9.7*	*19.4*

Note: Figures in italics are percentages

Scenario 5: ADG

ADG is another important factor in cattle fattening because this determines how much profit is received by farmers when they engage in cattle fattening. In this case, there will be four scenarios related to changes in ADG which were an increase and decrease in ADG by 10 and 20%.

Under the current ADG levels, cashflow and net profits are botth positive, except for small and medium-sized farmers where the full budget net profit remained negative. Net profit for medium farmers in the full budget are positive at a 10 and 20% increase in ADGs (Table 5-22). In contrast, a decrease of ADG of 10 and 20% decreases cashflow but remained positive except for medium-sized farmers. In the full budget, the net profit of large farmers was also negative with a 20% decrease in ADG.

Table 5-22. Changes in net profit after changes in ADG

No	Type of fatteners	Existing condition	Increase ADG by 10%	Increase ADG by 20%	Reduce ADG by 10%	Reduce ADG by 20%
		(IDR)	(IDR)	(IDR)	(IDR)	(IDR)
	Cashflow					
1	Small farmers	15,074	19,051	23,028	11,098	7,121
			26.4	*52.8*	*(26.4)*	*(52.8)*
2	Medium-sized farmers	5,731	9,508	13,284	1,955	-1,822
			65.9	*131.8*	*(65.9)*	*(131.8)*
3	Large farmers	10,104	13,966	17,828	6,243	2,381
			38.2	*76.4*	*(38.2)*	*(76.4)*
	Full budget					
1	Small farmers	-8,778	-4,801	-824	-12,754	-16,731
			(45.3)	*(90.6)*	*45.3*	*90.6*
2	Medium-sized farmers	-3,141	635	4,412	-6,918	-10,694
			(120.2)	*(240.5)*	*120.2*	*240.5*
3	Large farmers	5,636	9,498	13,360	1,774	-2,087
			68.5	*137.0*	*(68.5)*	*(137.0)*

Note: Figures in italic is in percent

5.5. Factors Determining Access to Credit

The overall aim of this chapter was to determine the main factors that influence farmers' access to credit. Some parameters were analysed using a logit model to define whether those variable impact the successful access to credit in the research locations. The result of this analysis has been presented in an international conference in Swaziland (see Mahendri et al. (2018)).

5.5.1. Justification for Identified Factors

There are many factors that may affect farmers access to credit, however, several parameters have been selected for the logit analysis and the justification for including them is reported in Table 5-23.

Table 5-23. Justification for selected variables for logit analysis

No	Varriables	Justification
1	Farmers' education	Farmers with better education tend to be open-minded and will work to develop their businesses and can efficiently utilize credit (Abedullah et al. 2009).
2	Primary occupation	Farmers are less confident to apply for formal loans especially for cattle fattening, without income to secure the loan, and to avoid business failure. Braverman and Guasch (1986) reported that program credit is accessed by large farmers who have more certainty of income from other activities.
3	Land owned	Area of land owned may be an important factor in accessing credit as property can be used as security against loan default.
4	Farmers group	Farmers are influenced by peers in their community, therefore when one applies for credit, others may follow.
5	Type of pen	Standard pens provide improved conditions for cattle. This will also influence credit approvals.
6	Number of cattle	The greater the number of cattle owned the more likely farmers are to apply credit, as cattle can be sold to cover the loan in cases of default.
7	Income from cattle	High profits from fattening cattle will encourage farmers to expand the business.

5.5.2. Logit Model of Factors Influencing Access to Credit

The Logit model of factors influencing access to credit shows the likelihood ratio chi-squared value of 57.13 with p-value of 0.0001. This number indicates that independent variables included in the model explain significant factors considered in the decision by farmers to access credit, even though there are still some factors not included in this model that may impact on farmers' decision making. Five factors appear to determine access to credit: primary occupation, area of land owned, participation in a group, number of cattle owned, and average income from cattle per fattening period (Table 5-24). Two other factors do not significantly influence access to credit: farmers' education; and type of pens (troughs).

Table 5-24. The output of logit analysis for factors determining access to credit

Parameter	Estimate	Chi-Square	Pr > ChiSq
Intercept	**-3.3891**	**13.4912**	**0.0002**
Farmer's education	-0.0690	0.4955	0.4815
Having off-farm and non-farm work as primary occupation	1.4013	4.3112	0.0379**
Total land area owned	0.000106	0.0107	0.0107***
Participation in farmers' group	1.4796	4.5687	0.0326**
Total cattle owned	0.2161	4.6069	0.0318**
Type of trough	0.2602	0.1478	0.7007
Income from cattle per period	4.04E-8	2.8421	0.0918*
Odd ratio estimates	**Point estimate**		
Farmer's education	0.933		
Having off-farm and non-farm work as primary occupation	4.061		
Total land area owned	1.000		
Participate in farmers' group	4.391		
Total cattle owned	1.241		
Type of through	1.297		
Income from cattle per period	1.000		

Note: *less significant with confidence level 90% (P<0.1); **significant with confidence level 95% (P<0.05); and *** very significant with confidence level 99% (P<0.01)

Source: Mahendri et al. (2018, p. 49)

Land assets

The area of land owned by farmers is correlated with access to credit. Results show that the number of respondents who obtained credit have total land areas higher than those who did not borrow (Table 5-25). Increasing land area by one-square meter, increases the probability of accessing credit by 0.000106 (Table 5-24). One explanation is that farmers with more land assets are better able to access credit because land is an important form of collateral for bank loans. However, this result is opposite to the study by Motsoari et al. (2015), where there was a negative relationship between land ownership and the ability of farmers to obtain loans. In that case, the borrowers came under a Government credit scheme that did not require land as collateral.

Table 5-25. Ownership of land (ha)

No	Type of land	Fatteners with credit			Fatteners without credit			P-value
		Average	Max	Min	Average	Max	Min	
1.	Rice fields (ha)	1.5	6.0	0.1	0.6	2.0	0.1	0.000
2.	Dry land (ha)	0.6	2.0	0.1	0.6	2.0	0.1	0.870

Note: P values indicate significant differences in land area (both rice fields and dry land) between farmers obtaining credit and those who did not

Off-farm occupation

Having an off-farm occupation is a significant factor in gaining access to credit (significant at five percent level). Farmers with a primary occupation outside cattle farming increase the probability of accessing credit by 1.4 times. This implies that those farmers who generate higher and more regular income from off-farm sources are seen as a lower risk of defaulting on their loans. This relates to the banks' evaluation processes whereby farmers with capital can access loans (Section 6.4.3).

This contrasts with the case of farmers in Lesotho, Africa where an increase in total non-farm income reduced the probability of obtaining a loan (Motsoari et al. 2015), because they were likely to use that non-farm income to purchase inputs for their agricultural activity. Farmers who are also fattening cattle in both sites in East Java usually use their external earnings to support their priority business which is their farming enterprise. Consequently, additional capital through a loan for cattle fattening is required. Based on data from the survey, 44% of respondents accessing credit to fatten cattle had a primary occupation outside farming, compared to only eight percent of farmers who did not obtain credit (Table 5-26).

Table 5-26. Primary occupation of cattle fatteners with and without credit

Type of occupation	Fatteners with credit		Fatteners without credit	
	Number of respondents	Percentage of respondents	Number of respondents	Percentage of respondents
Primary occupation				
Farmer	24	44	36	75
Fattener	2	4	3	6
Traders of cattle & other commodities (unhulled rice, others)	4	7	2	4
Labourer (rice mill, farm, or other manual work)	-	-	3	6
Teacher, village administration staff, other professional occupation	11	20	4	8
Private company/ entrepreneur	13	24	-	-

Group participation

The participation by farmers in farmers' groups has a positive correlation with success in borrowing capital and is a significant factor (at five percent level) that influences the access to credit. The probability of accessing credit increases by 1.5 times for those farmers who are involved in groups. Based on data survey (Mahendri et al. 2016), three-quarters of farmers who were successful in accessing credit also participated in farmers'

groups, while almost 50% of farmers who did not access credit did not participate in a farmers group (Table 5-27). Group participation is not a mandatory requirement to access credit, as some individuals did successfully access bank credit if they meet other criteria. However, if farmers form a group, accessing credit can be easier than for individuals in regard to preparation of proposals, budget planning, and getting assistance from livestock agencies or related institutions (training, permit letter, or recommendation), and this can reduce transaction costs for the banks. Cooperative groups can also provide the security as required by banks and offer easier administration of credit (Oluwasola & Alimi 2008).

Table 5-27. Farmers with and without credit involved in groups

Group member participation	Fatteners with credit		Fatteners without credit	
	No of respondents	Percentage	No of respondents	Percentage
Yes	41.0	75.9	25	52.1
No	13.0	24.1	23	47.9
	54.0	100	48	100

Total cattle owned

Total cattle (male and female) owned by farmers has a positive correlation with success in obtaining credit and is a significant influence ($P<0.05$) on access to credit. One criteria used by banks in assessing credit applications is capacity, which refers to the existing capital base of the borrower's business that determines the additional capital required. The existing capital could be in the form of current cattle owned by farmers when applying for credit. The results show that an increase of one in the number of cattle owned by the farmer is likely to increase the opportunity to obtain credit by 0.2 times (Table 5-24). In addition, data reported by Mahendri et al. (2016) show that farmers accessing credit have more cattle than those who did not borrow (Table 5-28). This indicates that Banks seem to help farmers to expand or develop their cattle fattening businesses rather than build a new fattening operation, so that farmers need to have cattle already to be able to borrow funds.

There were 65% of small farmers who had obtained credit had on average 2.2 to 2.5 cattle. However, 35% of the farmers with credit are large scale producers Moreover, 48% of farmers obtaining credit were involved in CCOs, while only 29% of the farmers who did not obtain credit were involved in that type of cattle production as reported by Mahendri et al. (2016). Many farmers have cattle in addition to those being fattened (including female cattle) to support their businesses.

Table 5-28. Number of cattle owned by fatteners with and without credit

No	Parameters	Fatteners with credit			Fatteners without credit		
		Number of respondents	%	Average number of cattle	Number of respondents	%	Average number of cattle
1	Number of male cattle owned (head)						
	Adult cattle						
	1-5	33	64.7	2.6	40	95.2	2.3
	6-20	11	21.6	9.1	2	4.8	6.0
	> 20	7	13.7	60.4	-	-	-
	Young cattle						
	1-5	5	71.4	1.8	4	100	1.5
	6-20	1	14.3	11.0	-	-	-
	> 20	1	14.3	27.0	-	-	-
	Calves						
	1-5	10	90.9	2.3	4	100	1.8
	6-20	1	9.1	7.0	-	-	-
	> 20	-	-	-	-	-	-
2	Number of female cattle owned (head)						
	Adult cattle						
	1-5	18	69.2	1.9	13	100	1.9
	6-20	5	19.2	8.6	-	-	-
	> 20	3	11.5	47.7	-	-	-
	Young cattle						
	1-5	-	-	-	3	100	1.3
	6-20	1	100	10	-	-	-
	> 20	-	-	-	-	-	-
	Calves						
	1-5	5	71.4	1.6	3	100	1.0
	6-20	2	28.6	7.5	-	-	-
	> 20	-	-	-	-	-	-

Source: Mahendri et al. (2016, p. 200)

Income from cattle

The total income from cattle has a positive correlation with access to credit, which confirms that by increasing this factor the probability of a farmer accessing credit also rises. Other criteria considered by banks in approving credit is “condition”, which refers to the prospects, productivity, and competitiveness of the cattle business. Income gained from cattle is one indicator of these conditions, as it could be expected that more income means the likelihood of repayment is greater. Banks seem more likely to approve a loan if there is a certain level of income already generated from cattle farming. However, the result is less significant, at the ten percent level. This is not surprising, because even though some farmers generate little income from cattle, they still seem to have greater

capacity to pay back loans when they have additional income from outside cattle production.

Education and type of pens

The education of farmers that accessed credit was significantly higher than those who did not. However, education levels do not significantly affect the probability of farmers accessing credit. This is partly due to the fact that farmers with credit, particularly those in groups, are helped by the group or the LSA to process their loan applications. In addition, the type of pens, with the trough and floor made from concrete, was not a significant factor in accessing credit. This is because the type of credit accessed in both areas was from the KKPE scheme (which requires standard pens). Other credit programs do not require farmers to use standard cattle pens.

5.6. Implications of Thesis Findings

There is some variability in the structure of the cattle fattening sector in the research areas. The different reasons for keeping cattle (CCO or fattening) affects the choice of production inputs with the flow-on effect on the need for additional capital. For example, farmers who are involved in cattle fattening will use more rice bran or concentrate for their cattle, consequently they need more working capital to buy this feed. Large farmers tend to keep both male and female cattle, while small farmers maximised the use of their limited pens by focusing on cattle fattening. Large farmers are more likely to use paid, non-family labour and buy feed cattle, while small fatteners utilise family labour to keep cattle and collect feed.

The differences in farm size and farmers' activities are also linked to the different types of fattening operations and the use of credit. Households with off/non-farm income who have less reliance on farm income are more likely to become large scale in fattening cattle because this large production would make them confident about accessing credit.

Survey results reveal something similar in the integration of feed sources such as rice straw from on farm production which is used by the large number of cattle fatteners whose primary occupation is food cropping. Cattle fattening is a secondary enterprise after crop farming. Moreover, the different household structures use the same marketing system where they buy cattle from the market and sell the finished cattle in the village/pen to cattle traders. The exception here is the case of larger farmers/fatteners.

Cashflow and budgeting analysis are important ways for both farmers and banks to assess credit applications. Farmers need to understand the cashflows generated to ensure repayment and banks can assess any likely default position and potentially reduce the risk

of non-repayment. Based on cashflow and full budget analysis, it confirms that only small proportion of credit has been successfully disbursed by banks for only limited cases (larger/efficient/experienced farmers) that generate positive profit in the full budget.

According to analysis of factors affecting access to credit, the wealthier farmers are more able to access credit, and increase the scale of their cattle production. Farmers with credit are more likely to have better pen infrastructure to house more cattle, thereby satisfying a condition of the credit they obtained. It is also important to note that farmers with access to credit are more diversified into cow-calf production and fattening, while the non-credit group is focused on cattle fattening. This is likely to reflect differences in capital demand and turnover of the two different cattle production activities and suggests that cattle fattening might be more important to the less wealthy section of the farming community. While not necessarily a condition of loans, farmers obtaining credit are much more likely to participate in cattle groups that usually involve training programs designed to improve cattle production systems.

CHAPTER 6 THE SUPPLY OF FINANCE FOR CATTLE FATTENING

While Chapter 5 analysed the demand-side of finance for cattle fattening by households in East Java, this chapter analyses structures on the supply-side. The increased capital flow to cattle fattening needs to balance all parties. Even if the demand for credit is high, lack of capital might be a constant problem for farmers if funds are not available. Identification of several types of funding for cattle fattening is important in this study to demonstrate the willingness of banks or lending institutions to support cattle fattening. This study has focused on formal financing although it has also examined interactions with informal lenders. Therefore, this chapter contributes to the study by clarifying the structures, status, ownership, and profit considerations of lending institutions and explores other potential funding sources. The chapter will conclude with an examination of the process of loan assessment and identify factors considered in the provision of credit for cattle fattening.

6.1. Types of Finance for Fattening Operation

The aim of this sub-section is to review major sources of funding for cattle fattening in Tuban and Lamongan including formal (Banks, Companies, and Government) and informal (Neighbors, Friends, and Traders). Sources of finance and the types of credit available for cattle fattening are summarized in Figure 6-1 and Table 6-1.

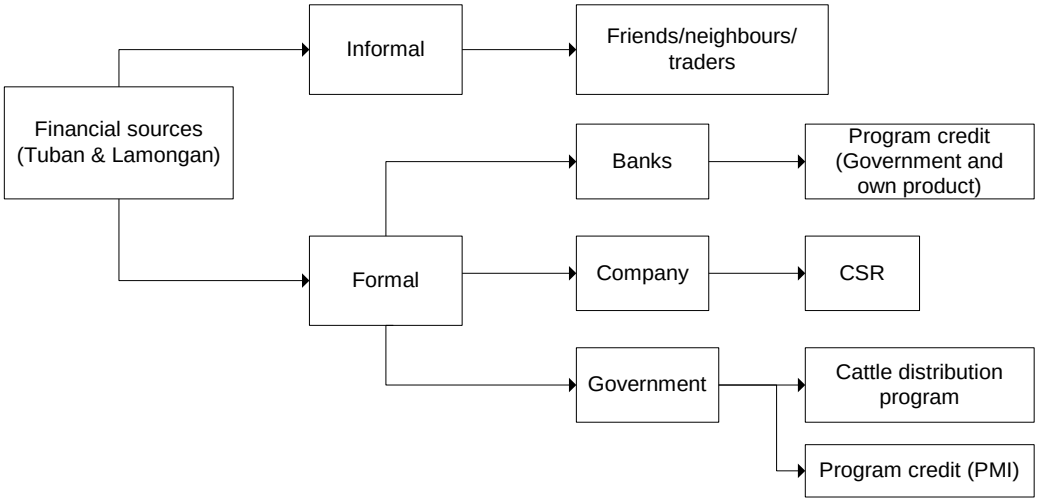


Figure 6-1. Sources of credit for cattle fattening in Tuban and Lamongan Districts

Table 6-1. Types of credit received by cattle fatteners in Tuban and Lamongan Districts

No	Type of credit	Tuban (%)	Lamongan (%)
1	Program/subsidised credit	77.9	71.4
	a). Bank (Government: KKPE, KUR)	90.7	48.1
	b). Bank (Own products)	9.3	3.9
	c). Local Government (PMI)	0	48.1
2	Cattle distribution program	0	2.9
3	Sharing cattle (gaduhan system)	8.8	20.0
4	Commercial credit	2.9	5.7
5	Company (CSR funds)	10.3	0

Both districts have the similar sources of credit for cattle fattening. Funds are largely sourced from formal institutions such as Banks that participate in program credit (78%) established by Government or from Banks such as Pundi Kencana (Bank Jatim), Food Credit/KKP (BRI), Simas agri (Simas agri), all with similar interest rates. In addition, in the Lamongan District, a scheme similar to KKPE called PMI (credit for the improvement of quality and intensification of cattle and other commodities), provides credit from the Local Government through the LSA-Lamongan District. It is managed by the Rural Bank (PD BPR Bank Daerah Lamongan).

Cattle distribution programs are also conducted by both the Local and Central Government to help small-holder farmers to increase their income from cattle. In this program, the only requirement is that farmers need to be associated as a group. In these programs, the return on this form of credit is in the form of cattle not cash. Farmers are required to return one or two cattle to the Government, with these cattle being further distributed to other farmers. The weakness of this program is that cattle are not usually returned as the farmers interpret the acquisition of the cattle as a Government grant.

Interestingly, the supply of informal credit, whether as cash loans or in the form of cattle, from individuals in profit-sharing arrangements appears to be low in both districts. This is contrary to the common Indonesian financing model, the profit-sharing arrangement (known as the “gaduhan system”) where, capital-rich but labour-poor households provide cattle to capital-poor but labour-rich farmers, who provide feed, labour, infrastructure and veterinary inputs (although some costs can be shared). On sale of the animal, the owners and the keepers share the profits, as a percentage (e.g. 60:40) of the weight added over the fattening period. Only nine percent of farmers surveyed in Tuban and twenty percent in Lamongan entered this profit-sharing gaduhan relationship. The low participation in this system in the research areas may be due to the relatively easy availability of formal credit schemes for cattle.

Small amounts of credit are accessed by farmers at commercial rates for livestock production, especially for cattle fattening. Loans at commercial interest rates are unaffordable for the majority of farmers and those who borrow from banks at commercial rates usually have other businesses that can be used as collateral. Otherwise, they might use the loan for a business other than cattle production.

The other source of finance for cattle fattening is from companies that use their corporate social responsibility budget (CSR) to support the community around their place of business. These companies are local and have an indirect relationship with farmers, for example, they may use the same village resources. This collaboration usually occurs after the establishment of the company in an area which involves or impinges on farmers' land. For example, in Tuban, East Java, there are credit schemes from PT Holcim Indonesia and PT Exxon available to cattle fatteners (Section 8.5 and 8.6).

6.2. The Structure of Banks

The key characteristics of Banks that supply credit for cattle fattening in Tuban and Lamongan can be classified by the type of bank, their formal status, ownership arrangements, basic capital, profit, funding sources, and assets (Table 6-2). The differences in these characteristics does result in different services but they all participate in Government subsidised credit to support food security in Indonesia.

Most Bank branch staff interviewed in East Java and Jakarta (Central) are Commercial Banks except for BPR Lamongan which is categorised as a Rural Bank. Their formal status is Persero tbk which means that the company is managed by the country or region and receives part or whole of their capital from the country's wealth in the form of stock (Mandiri, BNI, BRI, Sinarmas) or a regionally-owned business enterprise or BUMD (BPD Jatim). BUMD is managed by the region which has full authority to control its wealth and business activities. However, both aim to generate profit, service the public, and support the development of the region.

In 2016, the profits generated by the State-owned Banks (BNI, Mandiri, and BRI) were about IDR11.4-26.2 trillion, while other Commercial Banks (Sinarmas and BPD Jatim) earned IDR370-1,028 billion. BPR Lamongan generated less profit (IDR7 billion) compared to the other banks whose staff were interviewed. In addition, to their formal status, Bank ownership lies either with the Government, or the public. The ownership of banks can be defined by their capital base which is mostly sourced from the Government. In 2016, the Government provided about IDR6-15 trillion of capital to Commercial Banks, including IDR30 billion for BPR Lamongan.

Table 6-2. The characteristics of banks in Tuban and Lamongan Districts

No	Characteristics	BRI	Bank Mandiri	BNI	BPD Jatim	Bank Sinarmas	BPR Lamongan
		n= 5 (Central, branch, unit)	n= 1 (branch)	n= 1 (Central)	n= 2 (branches)	n= 1 (branch)	n= 1 (branch)
1.	Type of bank	Commercial Bank (state-owned bank)	Commercial bank (state-owned bank)	Commercial Bank (state-owned bank)	Commercial Bank (regional bank)	Commercial Bank (foreign exchange bank)	Rural Bank
2.	Formal Status	Persero tbk	Persero tbk	Persero tbk	Regional-Owned Business Enterprise (BUMD)	Persero tbk (foreign exchange)	Local Company
3.	Ownership	Government (56.8%), public (43.3%) which 9.5% domestic and 33.8% international	Government (60%), public (40%)	Government (60%), public (40%)	Provincial Government of East Java (51.4%), regency in East Java (28.5%) and public (20.1%)	PT. Sinarmas Multiartha Tbk. (56.1%), PT Shinta Utama (2.6%), Public (41.4%)	Local Government lamongan (73.3%)
4.	Basic capital	IDR15 trillion	IDR16 trillion	IDR15 trillion	IDR9 trillion	IDR6 trillion	IDR100 billion
5.	Profit (2016)	IDR26.2 trillion	IDR14.7 trillion	IDR11.4 trillion	IDR1,028 billion	IDR370.7 billion	IDR7.01 billion
6.	Source of funds	Mostly third party (giro, savings, deposits)	Mostly third party (giro, savings, deposits)	Mostly third party (giro, savings, deposits)	Mostly third party (giro, savings, deposits)	Mostly third party (giro, savings, deposits)	Mostly third party (savings, deposits)
7.	Asset (2016)	IDR1,004 trillion	IDR1,038 trillion	IDR603 trillion	IDR 43.0 trillion	IDR31.2 trillion	IDR374.9 billion

Source: Bank Indonesia (2013a); Bank Jatim (2016); Bank Mandiri (2016); BNI (2016); BRI (2016); PT Bank Sinarmas (2016)

In regard to funding sources, the Banks mostly mobilise third-party funds (giro, deposits, savings) from the general public, although there are also some other sources such as borrowing from other Banks. In 2016, the assets owned by the State-owned Banks (BRI, BNI and Mandiri) was IDR603-1038 trillion, while other Commercial Banks (BPD Jatim and Sinarmas Bank) reached IDR31-43 trillion, with BPR Lamongan at IDR375 billion.

As long-established banks seek to extend their services, they seek to build and extend working units. Generally, the structure of the bank consists of head offices, regional office, branches, supporting branches, and cash offices (Figure 6-2).

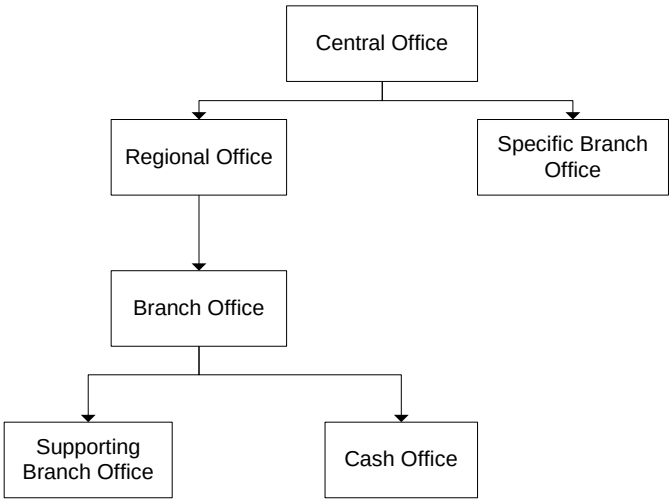


Figure 6-2. General structure of banks in Indonesia

There are several differences between each working unit in terms of activities, scope, and loans provided (Table 6-3). Most bank activities (cash services, customer services, lending services, other business and financial services) are undertaken within branch offices, followed by the supporting branch office, and cash office. However, according to the interview with BRI, the Central and Regional offices may also be involved in credit allocation (very large loans, Central) and large loans (by the Regional office).

In general, the central bank (usually located in Jakarta except for Rural and Regional Banks) is responsible for the planning and monitoring of policy in all working units. This function is also part of the Regional Offices' activities, as a representative of Central Office for administration and coordination purposes. Each Province has one to two Regional Offices depending on the size of the region with these Regional Offices supervise several Branch Offices.

In the Bank structure, the position of Branch office is below the Regional Office and the Leaders of Branch Offices are responsible to the Leader of the Regional Office. In the case of BRI, the Leader of the Branch Office supervises three Managers (marketing,

operations, micro business), an Internal Audit branch, and the Leader of Supporting Branch Offices. There are four units in Marketing and Operational Divisions, while Micro Business Managers supervise only two units (Manager's Assistant and the Inspector). The account officer who is responsible for marketing credit including program credit are part of the Marketing Division. In the Mandiri Bank, Micro Mandiri Manager (M3) is responsible for decisions in relation to borrowers, particularly for amounts less than IDR50 million. However, decisions in relation to loans greater than IDR50 million, must involve the Cluster Manager.

Table 6-3. Different structure of banks in term of some features

No	Features	Central office	Branch office	Supporting branch office	Cash office
1.	Activities	Planning and monitoring policy; Limited bank activities	Complete bank's activities	Part of bank's activities (proportion of budget)	Small part of bank's activities
2.	Scope	Capital City of Indonesia (Jakarta)	Every province, or main districts	Big cities to sub districts; close to traditional markets	Sub districts to village; close to traditional markets
3.	Level of relationship to consumer	Not close	Reasonably close due to wide-ranging scope	Close but still not familiar with consumers	Close and know their consumers well
4.	Proportion of credit allocated	Large loan activities	High number of credit applications	Less applications than branch office	No lending activities

In terms of bank activities, Branch Offices conduct all bank activities such as cash services, customer's services, lending services, other business and financial services. Those broad activities at Branch Office level are necessary according to wide scope of activities they provide in provinces, big cities, or districts. Supporting Branch Offices function to support Branch Offices, especially those activities that involve areas that far from the Branch Office.

Finally, Cash Offices are the smallest Bank units and only conduct cash services, while the Cash Unit (the smallest working unit in BRI) may also service small loans up to IDR25 million. The number of staff in these small units (Cash Offices or Cash Units) are less than those working in higher level units. However, there is usually a close relationship between bank staff and customers because unit offices are located mostly in the traditional markets, sub-district cities, or villages.

6.3. Loans for Cattle

Banks in Tuban and Lamongan provide several types of loans to customers with some being available to developing cattle enterprises. They may be further narrowed to include credit for cattle fattening.

6.3.1. Types of Products

The banks interviewed in this study provide similar products, for example savings accounts (deposits, current account etc.), loans (micro, consumer or program) and bank services including business and financial services and e-banking. In 2016, savings accounts accounted for the largest amount of third party funds, more than 36% (Table 6-4).

Generally, the allocation of credit for agriculture is less than other types of credit. BRI provides about 35% of its advances as micro and program credit while Bank Jatim allocates about 10% of its credit as productive loans for agribusiness and business. Both Mandiri and BNI provide 11% of credit to the agriculture sector, while Sinarmas Bank provides only 9% of their loan capacity in this area (0.05% for Simas agri/cattle fattening).

There are also differences in the allocation of credit between branches of the same bank. Based on interviews with staff at BRI, the availability of loans for program credit in Tuban is about 25%, while commercial and retail credit is about 50% of the total provided by BRI. In contrast, BRI Lamongan provides about 5% of lent funds as program credit. It is likely that the allocation of program credit is influenced by demand for these loans in these areas.

In 2015, BRI provided program credit to the value of IDR9.3 trillion, to more than 71,000 debtors. Of this credit 64% was KUR Retail, followed by credit for food (10%), and Non-KUR credit (26%). The breakdown of Non-KUR credit included KKPE for livestock (64%) and 36% to other credit schemes. In 2016, the program credit provided by BRI increased to IDR10.3 trillion (BRI 2016). Interestingly, within the agricultural sector, livestock accounts for a large proportion (about 30%) in both districts (interview data).

Productive loans established by Bank Jatim in 2015, consisted of KUR (15%), KKPE (4%) and other micro loans (81%). This percentage of productive loans decreased in 2016 due to the decreased disbursements amounts by KUR and KKPE which were only 5% and 1% of total productive loans (Bank Jatim 2016). Bank Jatim in Tuban and Lamongan distributed about 21% of total productive credit in 2015 for agriculture, and less than that proportion was for livestock (interview data).

Table 6-4. Types of products provided by different banks

No	Type of Products	BRI	Bank Mandiri	BNI	BPD Jatim	Bank Sinarmas
1.	Savings					
a.	Third party funds	Total (IDR754.5 trillion): - Currents accounts (18.9%), - Savings (40.2%), - Term deposits (40.9%)	Total (IDR762.5 trillion) - Currents accounts (24.5%), - Savings (39.6%), - Term deposits (35.8%)	Total (IDR435.5 trillion): - Currents accounts (28.2%), - Savings (36.4%), - Term deposits (35.4%)	Total (32.8 trillion) - Currents accounts (45.3%), - Savings (36%), - Term deposits (18.5%)	Total (IDR25.1 trillion): - Currents accounts (2%), - Savings (96%), - Term deposits (2%)
b.	Savings products	Britama savings, BRI junior, Simpedes etc.	Mandiri savings, deposits, etc.	Tabungan plus, BNI pandai etc.	Tabunganku, SimPel etc.	Simas Diamond/ Gold/Junior, etc.
2.	Bank Services	- Institutional services - Business and financial services - E-banking - International business services - Treasury services	- Treasury services - Trade services - Trade finance - Agen services, financial advisory - E-channel - Wealth management	- Business and financial services - Wealth management - E-banking - Insurance	- Business services - Institutional services - E-channel and other services	- Travellers Cheque - Virtual Account Sinarmas - Bill Payment, - Export Import - Cash Letter Services, - Wealth Management
3.	Credit	IDR663.4 trillion	IDR662 trillion	IDR393.3 trillion	IDR29.7 trillion	IDR19,4 trillion
a.	Loans for agriculture	- Retail (38.1%) - **Micro and program (34.5%)** - Cooperate (27.5%) Micro credit (IDR211.5 trillion) includes KUR micro (24.4%) and Kupedes (75.6%) Program credit (IDR10.3 trillion) includes KUR retail and Food credit KUR: IDR69.5 trillion) includes micro (IDR61 trillion); retail (IDR8 trillion); workers (IDR500 billion)	- Wholesale and retail trade (21.8%) - **Agriculture: (10.6%)** - Others (67.6%) KUR: IDR13.3 trillion	- Manufacture (18.6%) - **Agriculture (11%)** Medium credit (IDR61.3 trillion) - **Agriculture (3.6%)** Small credit IDR50.7 trillion: - **Agriculture (5.7%)** **KUR:** IDR11.0 trillion	- Productive loan (9.7%) 1. Pundi Kencana (45.4%) 2. KKPE (1.0%) 3. KUR (5%) 4. Micro Jatim (19.6%) 5. Others (29%) - KUR: IDR142.5 billion - KKPE: IDR27.6 billion	- Wholesale and retail trade (30.7%) - **Agriculture (9%)** Micro credit and small business IDR1.8 trillion: - Simas Agri (0.05%)

Source: Bank Indonesia (2013a); Bank Jatim (2016); Bank Mandiri (2016); BNI (2016); BRI (2016); PT Bank Sinarmas (2016)

6.3.2. Credit for Cattle Fattening

Within the research areas, there are six types of program credit that can be used to fund cattle fattening. They were established by the Government (KUR and KKPE); Local Government of Lamongan (PMI), and from bank resources (Food credit, Pundi Kencana and Simas Agri) and the characteristics of these credit products are presented in Table 6-5. In general, these credit instruments aim to support productive business by small-holders in agriculture, industry, trade or other sectors that support food security and food sovereignty.

Table 6-5. Characteristic of credit instruments used for cattle fattening in Tuban and Lamongan Districts

No	Parameter	KUR	KKPE	Food credit	Pundi Kencana	Simas Agri	PMI
1.	Credit limit	IDR25 - IDR500 million	IDR50-100 million (individual farmers); IDR500 million (group)	Maximum IDR500 million	Maximum IDR500 million	Maximum IDR200 million	Maximum IDR 10 million per person
2.	Time	3 years	2 years	3 years	3 years	5 years	1 year
3.	Effective interest rate	9%	5.5% for livestock	13-15%	13-15%	9%	6% of total plafond
4.	Subsidy	7% for new KUR	7.5%	No subsidy	No subsidy	No subsidy	6%
5.	Source of loan funds	6 public banks and 13 BPD	9 public banks and 12 BPD	BRI	BPD Jatim	Sinarmas Bank	Local government budget managed by BPR Bank Lamongan

The subsidy for interest rates on KKPE loans is determined by the Government depending on available funds and is discussed with the Banks to determine the percentage reduction that can be offered by each Bank. At the time of interview, the effective interest rate was about 5.5% which was lower than the commercial rate of 13%, due to a Government subsidy of 7.5%. This interest rate is similar for other non-livestock commodity credits, except for sugarcane, which receives a lower government subsidy. According to Table 6-4 in Section 4.2.3, the percentage of the KKPE quota provided for livestock was on average 29% of the total quota provided by the Government for all sectors. Total credit disbursements for livestock was about 48% of the total quota for livestock or only 11% of total quota KKPE.

The Government will determine the percentage of KKPE for each Province and each Bank, so in 2014, the East Java Province quota for livestock was 27% (Direktorat Pembiayaan Pertanian 2014a). However, total loan disbursements for livestock was only 12%. According to Table 6-6, Bank Jatim allocated a greater proportion of KKPE credit which was 223% of the total quota for livestock. This might be because Bank Jatim applied less strict conditions on their borrowers.

Table 6-6. Total KKPE credit allocated to interviewed banks in 2014 (IDR million)

Bank	Quota for livestock	Total quota for all sectors	Percentage	Realisation-livestock	Percentage
BRI	1,783,000	5,983,000	30	441,885	25
Mandiri	20,000	35,000	57	14,058	70
BNI	43,000	326,700	13	11,680	27
Bank Jatim	39,950	85,000	47	89,258	223

Each bank has their own rules for disbursing credit to their working units depending on business prospects in those areas. For example, BRI and Bank Jatim determine the percentage of loans for each area, but other banks such as Mandiri did not determine the percentage of credit per branch, allowing all working units to apply as needed to meet requirements.

In Tuban, with the most prospective business in cattle, BRI distributed KKPE credit in 2015 mostly for cattle (IDR3 billion), sugarcane (IDR500 million), and for goats (IDR500 million). This exceeded the target of IDR2.7 billion for livestock. Surveyed farmers reported that they could not apply for this type of credit because the loan funds had run out suggesting demand for cattle fattening credit exceeds capacity (see Section 4.2.3 and Table 4-6). KKPE credit for cattle amounts to 40 accounts (about 80 people). Only 20% of applicants were rejected because they had already received other credit.

In contrast, in Lamongan, food crop and estates are perceived as more deserving with BRI, since 2012, providing more funding under the KKPE program for food crops (IDR9 billion), cattle fattening (IDR2.8 billion), fisheries (IDR2.1 billion) and sugarcane (IDR16 billion). However, there is a high demand for credit for cattle fattening reported by farmers and this is indicated by more than hundred percent (110%) of funding allocated for cattle fattening being distributed before the end of 2015. The 10% shortfall came from other branches of BRI (under the same regional office in Surabaya). In contrast, the available funding for food crops, which was higher than for cattle fattening, had not been fully distributed. This might change the allocation of credit for this sector in the future.

Credit provided by Bank Jatim under the KKPE scheme was distributed to three sectors, namely cattle fattening (70%), agriculture (20%), and fisheries (10%). Bank Jatim

prefers to lend to individual applicants rather than group applicants because group applicants do not always take or transfer responsibility for the loan. Almost 80% of applications were approved for loans of between IDR100 to 500 million per person.

In 2016, the Government established a new KUR program with a 9% interest rate to replace KKPE that officially ceased on 31st December 2015. The target of KUR was to distribute IDR100-120 trillion, which was higher than the previous scheme, which was about IDR40 trillion. The source of money is from the Banks and the Government provided about IDR10.5 trillion in subsidies (Widiyanti 2018). Total funds sucessfully lent by the bank was IDR94.4 trillion with non-performing loans (NPLs) 0.37%, dominated by BRI (IDR67.5 trillion), Mandiri (IDR13 trillion), BNI (IDR11.5 trillion), and Bank Sinarmas (less than IDR4 trillion) (Kusuma 2017). The large allocation of KUR to BRI helps that bank to increase their market dominance in micro, small and medium enterprise credit support.

More program credit is available through PMI, which sourced its capital from the regional expenditure budget (APBD) and supplies credit through Rural Banks (BPR Lamongan). There was a high demand for these funds, which totaled about IDR4-5 billion per year. However, the loans provided were constant at about IDR2.2 billion because the Local Government's budget was limited. The amount lent per group depends on the number of members in each group. Each farmer usually borrows IDR10 million for the purchase of feeder cattle each year, at an effective interest rate of six percent. The assessment of the loan applications is done by the bank, but the Local Government as source of funds gets two percent of the interest rate while the Bank gets four percent of it (1% goes back to the group and 3% covers the operational costs of the bank).

Credit programs established by BRI, BPD Jatim, and Sinarmas Banks are also other sources of funding for cattle fattening. The interest rate is similar to a new KUR loan which is about 9% per year. Banks usually offer these facilities to their closer borrowers who cannot apply for KUR or KKPE funds because of outdated quota. As an example, Simas Agri was introduced to farmers in July 2016 and has been distributed since September 2016. Until January 2017, 33 farmers have benefited from this credit. The target for 2017 is about 500 farmers borrrowing IDR40 billion. However, Sinarmas Bank only offers credit to small-holders who are recommended by other parties, for example, a Company or Institution who knows the farmer well.

There is evidence of a high demand for subsidised credits in the research areas. BRI Tuban and Lamongan have already increased their quotas by reallocating funds from other branches under the Regional office. A high demand for credit within the research areas may exist because there are more prospective businesses in cattle fattening. Banks

find the cattle business attractive based on market prospects, production, and repayment rates (Bank Indonesia 2013b). Moreover, there may be greater promotion of these credit schemes in these areas which are aligned with the development of partnership links with commercial traders/feedlotters or companies and the growth of a strong institutional setting (cooperatives, and farmers' groups). In addition, KUR loans for livestock can also be used for other species. KUR loans in Lamongan are mainly used for poultry, while KUR finance in Tuban is used mostly for fisheries. Some cattle fattening households who applied for this credit usually have other business activities such as cattle trading which generates more consistent income to repay loans.

Banks are not formally penalised for disbursing their quota of loans outside the nominated subsector. However, the Government can exclude the bank from the program if the non-performing loans for micro- and small businesses is higher than five percent and portfolio credit for these businesses is lower than five percent (Kementerian Koordinator Bidang Perekonomian 2018b). If they decline to participate, the banks lose goodwill and may be excluded from other government policies or programs. Furthermore, most participating banks are public institutions and have some obligations to public programs.

6.4. Loan Assessment Processes

This section describes the formal process for attaining credit for fattening cattle including the lending criteria, and credit analysis, in order to expedite the process of providing credit facilities.

6.4.1. Lending Criteria

In general, the loan assessment criteria for cattle fattening is not substantially different between the different types of credit referred to above (KUR, KKPE, PMI). However, KUR and KKPE schemes have more strict criteria compared to PMI, possibly because the scope of the latter scheme is not wide. Some requirements for each credit scheme are shown in Table 6-7.

Table 6-7. Criteria for assessing for cattle fattening under credit programs

No	KUR	KKPE	PMI	Food credit	Pundi Kencana	Simas Agri
1.	Must have productive and feasible business for minimum 6 months (KUR), or 1 year (Food credit)					
2.	Borrowers do not receive other program credit at the same time from Bank or Government, except consumer credit					
3.	No need for additional collateral	Needs additional collateral	No need for additional collateral	Needs additional collateral		No need for additional collateral
4.	Apply individually or in groups	Apply individually or in groups	Must be in a group	Apply individually		
5.	Farmers should be endorsed by agricultural institution			No need for endorsement	No need for endorsement	References from third party
6.	Administrative requirements: recent photograph, minimum 21 years with identity card, family certificate, tax file number, certificate of residence and formal letter from the village leader stating that farmers own the business (business certificate)					

The first criteria are related to the business that will be funded. Put simply, the business has to be productive, feasible, and generate sufficient cash surplus to pay back the loan. Even if not stated specifically in the loan assessment criteria under the KKPE, PMI, Pundi Kencana and Simas Agri schemes, Banks certainly consider this factor important in the assessment process. Borrowers are required to have a feasible business, but it may not provide sufficient security, and there needs to be a guarantor who enters an agreement with government and banks to get KUR credit. In fact, Banks will sometimes ask prospective borrower to provide collateral even though the program does not require it.

The second criteria require that the borrowers do not receive credit from other Bank or Government programs, other than consumer credit. Previous loans of applicants are checked by the Banks in the assessment process, through the Individual Debtor Information (IDI) history[3]. However, this online check for PMI credit is not required, applicants just need to be in a group and endorsed by LSA-Lamongan District.

In terms of collateral, some credit programs (KKPE, Food credit, and Pundi Kencana) require additional collateral from borrowers to ensure surety if the loan cannot be repaid. The collateral can be any goods, for example land, buildings, or vehicle certificates where the value is similar to the loan. However, for KUR credit, the Government provides security for the Banks and pays a guarantee fee of about 3.3% per year of the value of KUR credit outstanding to the Guaranty Company, and this Company

[3] Since 2006, Bank Indonesia (through Credit Bureau) has established Individual Debtor Information (IDI) history which contains information related to credit records or loan facilities data, and this can be used by financial institutions to identify the credit worthiness of debtors.

provides insurance for the Banks' loans. In contrast, PMI and Simas Agri do not require collateral. Most debtors who applied to PMI for loans have already been approved by LSA, while borrowers from Simas Agri have already been recommended by other Institutions (such as a feed mill).

KKPE and KUR credit can be applied for by individuals, groups, or cooperatives as long as they fulfil the criteria. If the borrower is a farmers' group, they must consist of some members, a group leader, and secretary and need to be registered with formal institutions such as villages, LSA etc. However, new KUR and some other credit schemes (Food credit, Pundi Kencana, and Simas Agri) are applied for individually, even if they prepare the applications in a group.

Finally, all types of credit have similar administration requirements and expect borrowers to undertaking training from a livestock institution (LSA, BP2KP) or other related institution. However, Food credit, Pundi Kencana, or Simas agri do not need assistance from livestock services. Simas Agri does require a reference from a third party (an input supplier) to reduce risk exposure for the Bank.

6.4.2. Credit Processing

In general, the application process for KUR is similar to KKPE and involves the Bank, borrowers, and livestock services (Figure 6-3). Farmers apply for KUR/KKPE credit through their banks, although the loan enquiry and application are often assisted by a livestock services agency (in this case LSA or BP2KP). The Bank will evaluate the borrower's application, and if the application fulfils the Bank's requirements, the loan will be distributed to the borrower. The borrower is responsible for the repayment of the loan directly to the bank. However, if farmers apply for the loan in a group, the application process, including the disbursement and repayment, is completed through the group. The duration of the loan assessment and approval process is usually around 14 working days but may depend on the borrowers' capacity to meet requirements and supply documents.

With KUR, loan applications can also be processed through Linkage Institutions (PT Asuransi Kredit Indonesia, PT Jamkrida Jawa Timur, and PT Jamkrida Bali Mandara as a Guarantor Company). Linkage Institutions can apply for loans up to a maximum of IDR2 billion with an interest rate 13% per year. The Bank will evaluate the borrowers' application, and if the application fulfils the Bank's requirements, the loan will be distributed to the Linkage Institution and then transferred to borrowers. Linkage Institutions can provide a maximum of IDR100 million to borrowers at an interest rate 22% per year.

The repayment system for this credit is executed in two ways, with repayment through the Linkage Institution, or repayment directly to the Banks.

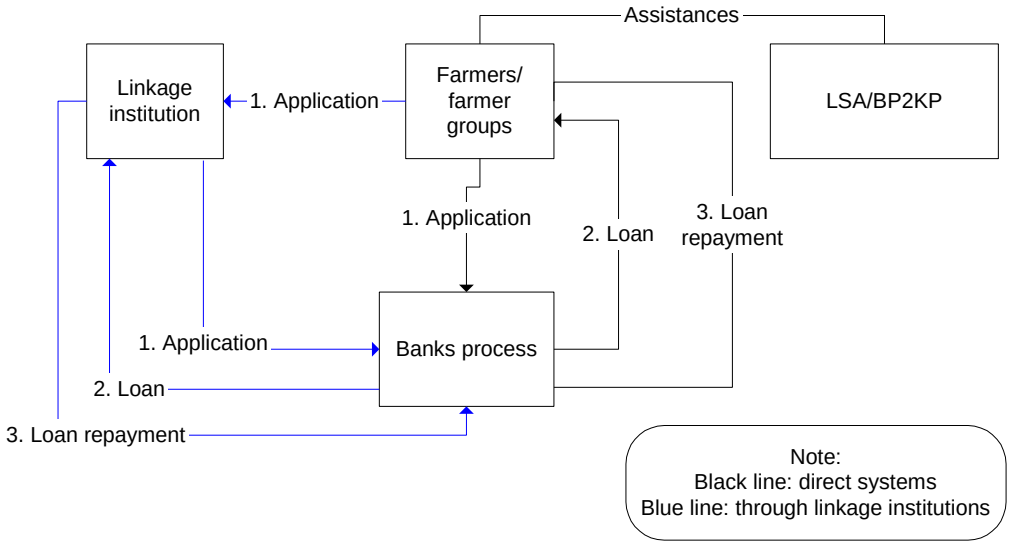


Figure 6-3. The formal process to apply for KUR and KKPE credit

As PMI is only established in Lamongan, the application process requires working with LSA-Lamongan District and BPR Lamongan as shown in Figure 6-4. After receiving a recommendation from LSA Lamongan, farmers send their loan proposal to the Bank for assessment. The Bank will distribute funds to farmers through groups and farmers also have to return the loan through a group. As the source of funding is from LSA-Lamongan District, this Institution can provide recommendations, technical advisors, and monitors loans by visiting farmers regularly. BPR Lamongan who manage the loan also helps the Government to promote this program and report to LSA Lamongan District.

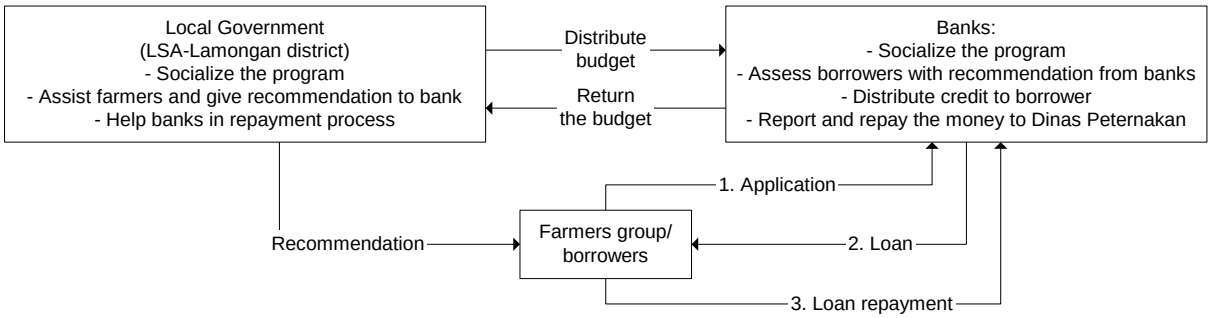


Figure 6-4. The formal process to apply for PMI credit

The loan processing arrangements for Food Credit, and Pundi Kencana are similar to KKPE/KUR except assistance and recommendations are not necessary. The Bank will assess their borrowers, in the case of BRI in Tuban, the bank disburses food credit on the recommendation from well-known customers, but still relies on a bank credit assessment.

Similar to these schemes, processing for Simas Agri credit requires references from a third party such as input suppliers.

6.4.3. Credit Assessment

The provision of credit for livestock is the same as for other general credit facilities. One exception is the recommendation from LSA or BP2KP for the livestock sub sector. Banks are careful to assess risk before providing loans for any commodities, especially livestock or agriculture, where the risk of failure is higher compared to other businesses such as trading. Credit assessments are important to identify that the businesses conducted by applicants are feasible, marketable, and will lead to successful loan repayment.

While there is no perfect method to ensure borrowers fulfil their agreement to repay their loan, Banks have established several steps to determine whether to lend credit to potential lenders. In general, Banks including those interviewed in Tuban and Lamongan, use the Five C's of credit: character, capacity, capital, condition, and collateral.

Character

Character means the applicants need to have a good credit record or reputation for paying debts on time. There are two methods to assess the character of borrowers which are qualitative and quantitative. The qualitative method is achieved by interviewing borrowers or by calling for references from someone who knows the borrower well. The quantitative method is completed by a review of the borrowers' credit history. The main reason for loan refusal is default on repayments, or outstanding obligations to other lenders. Banks have an online system to check the borrowers IDI history. Bank Indonesia under SE BI No 30/16/UPPB established on the 27th February 1998, defined five levels of debtors' credibility which are:

1. Pass (collectability 1), the condition of credit where there are no arrears
2. Special mention (collectability 2), if borrowers are in arrears up to 90 days.
3. Sub-standard (collectability 3), if borrowers are in arrears up to 120 days
4. Doubtful (collectability 3), if borrowers are in arrears up to 180 days
5. Loss (collectability 3), if borrowers are in arrears above 180 days

If the credit rating is collectability three to five, it means that the loan is categorized as a non-performing loan.

Capacity

Capacity relates to the capacity of borrowers to repay credit, and this can be established by a successfully run business. This may include attendance and certification of livestock training held by LSA or other Institutions involved in cattle fattening. In Tuban and Lamongan, LSA or BP2KP help farmers with business planning and management including budgeting and best practice management. For Banks, this can help to screen farmers and minimize risks. It is assumed that farmers running a successful business and have attended training will manage their cattle and business well.

Moreover, the capacity of farmers to provide permanent and standard pens is also assessed by banks. BRI requires that farmers have standard pens according to BP2KP standards. However, Bank Jatim in Tuban and Lamongan is more flexible in their assessment of pens. This Bank accepts borrowers as long as there are pens to house the cattle, even if they do not reach BP2KP standards. In addition, applicants are required to submit a business permit letter signed by a Village Leader.

Capital

Capital refers to existing money that borrowers put toward the investment and determines the amount of additional capital required (through the loan) to develop that business. As a result, applicants with existing business operations they may want to expand or diversify are more likely to receive loans than those that have no existing business. Famers also need to submit a budget that includes the purchase of feeder cattle, feed, veterinary expenses and pen maintenance during the fattening period.

Condition

“Condition” refers to the prospects, productivity, and competitiveness of the cattle fattening business. One indicator includes average daily gain, which BRI sets as a minimum of one kg per day for four to six months. Bank Sinarmas base the condition on the amount of feed that has to be given to cattle and leads to weight gain. Another indicator used by BPD Jatim is the expected profit, based on the experience of fatteners in their business. In all cases, Banks need to be confident that borrowers have the technical and management skills to make loan repayments within the specified period, which is generally set over six months fattening period.

Collateral

Collateral refers to the personal assets of borrowers that can be seized by the Banks should the borrowers default on the loan. Based on the interviews with bank staff,

collateral is the last factor considered in the loan approval process. The value of collateral should be similar to the value of credit applied for, although it may also depend on other factors of character, capacity, capital, and condition. Types of collateral accepted are land certificates, vehicle ownership certificates, or other items of value. Bank Jatim and BRI as reported by Bank Indonesia (2013b), tend to prefer land certificates, business premises, or bank deposits as a form of collateral.

However, most farmers do not have a land certificate, creating uncertainty for the farmer wishing to apply for credit. To assist farmers to provide some form of collateral, BRI connects farmers with a legal notary who can help them to obtain a land certificate. During the certification process, the notary will issue a cover note, which is a temporary certificate, indicating that the land is in the process of certification, which usually takes about three months. This cover note, can then be used as collateral to process the credit application until the land certificate is issued. The cost of the certification process is about IDR5 million but varies by region.

Collateral is not an absolute requirement for a loan application. According to the banks, collateral acts as a bond and a way to motivate borrowers to manage the loan. Sugiarto (2011) reported that when they do not need to offer collateral, farmers think that the loan money is free, and they do not need to return it. Even so, interviewed banks place character and capacity as the most important aspects in loan assessment as reported by Winarso (2015) and Wulandari et al. (2017). While Prasetyo et al. (2012) reported that capital and collateral are important in loan assessment: greater value of collateral and capital usually results in better repayment rates.

Banks use the Five C's when making lending decisions, while the discussion identifies that a lack in one area can often be balanced out when a borrower is stronger in other areas. For example, a borrower with weak character as evidenced by past defaults might still get a loan if guaranteed with good collateral.

6.5. Factors that Affect Supply for Credit for Cattle Fattening

It has been established that support and collaboration between farmers through farmers' groups is likely to improve the success of a cattle business (Elly et al. 2008) and will reduce the risk for Banks in distributing credit. However, the existence of a group does not necessarily substitute for the lack of collateral. Even when applying for credit as a group, each farmer needs to provide a land certificate. Lending to groups can also be more risky than individual applications. Bank Jatim suggested that it is difficult for Banks to intervene with groups because they can transfer the responsibility to other members.

However, transaction costs for Banks can be reduced when loans are sought by an organised group.

Technical support and assistance provided by a Livestock Institution or other organisation concerned with cattle fattening can affect the disbursement of loans by Banks. Technical support can reduce the risk of failure and a relationship with the Livestock Institution appears to have a positive effect through transmission of information. Banks are more confident to finance a business that is conducted by farmers who have demonstrated capability in cattle fattening. Dahri et al. (2015) also suggested that assistance is needed by farmers to develop successful businesses and reduce failures in loan repayments.

Partnerships between actors may also reduce risk exposure and often exist between input and output suppliers, such as traders and large producers (Newbery 1989; Meuwissen et al. 2001). In the contract with these agribusiness, farmers will gain contacts to source feeder cattle and get access to a certain market for their finished cattle. This may protect the farmer's investment, not having to sell cattle when the price in the market is low and increase their income (Suardika et al. 2015), which in turn creates greater certainty for Banks.

Support is also available from Government and Research Institutions through Economic assessment support in the form of a cashflow analysis. A cashflow analysis will indicate the feasibility of the business and the possibility of future profit. This help farmers to understand their capacity to pay back loans and are also viewed positively in a credit assessment. Research Institutions can also provide information to improve productivity in cattle enterprises.

Government policies in the form of subsidy programs are another factor affecting supply of credit for cattle farmers. Subsidised credit is viewed less favourably by Banks as while such loans may generate the full interest rate, they achieve less profit as borrowers do not need to pay application fees, only the administration fee. Moreover, subsidies from the Government can be delayed which consequently inhibits the Banks' cashflow. However, the interest rate does not significantly influence the supply of credit because the targets for loans are usually determined by the bank head offices (Pasha 2009). The participation of the Banks in subsidy programs provides an opportunity to access more borrowers and introduce their own services such as savings accounts and other products. Bank Indonesia (2013b) confirmed that the motivation for Bank Jatim and BRI in Lamongan District to disburse loans for cattle fattening was in order to participate in the Government program.

However, the Banks are only able to supply loans to farmers if they have sufficient funds available. Generally, money is sourced through third party savings, when these savings increase, the amount of money available for disbursement will also increase (Pasha 2009). Therefore, increasing savings is an important consideration for Banks, prompting them to create strategies such as good interest rates or other incentives to encourage people save their money.

6.6. Implications of Thesis Findings

The supply of finance for cattle fattening in Indonesia, particularly within the research area, is sourced mostly through Government and Bank program credit. While cattle fattening represents only a small portion of these program credits, the sub sector has become an interesting segment for banks. For example, Sinarmas Bank and other companies such as Holcim and Exxon through their CSR programs are investing in cattle fattening businesses. It has been demonstrated that Bank structures have little effect on the disbursement of loans however some impact may be experienced due to low credit limits at lower level work units. However, the prospect of successful business being conducted in each area is a substantial factor in determining the percentage of funds allocated regionally.

In general, the loan application process is similar between all types of lending institutions which principally provides surety to the Banks for loans made. As with other loan applications, cattle assessments for cattle businesses abide by the Five C's rule. Character is a major factor to decide which farmers get loans and this might vary between bank staff. As an example, one respondent was screened out at one bank, but might receive a loan from other banks.

Even though the government has established subsidised credit programs to develop cattle fattening, there are some conditions required to gain access to this credit. The most important thing is to convince the bank that the business is profitable through technical and economic support from government, research institutions, suppliers, or other related actors. That support should lead to a successful business and reduce the risk for banks.

CHAPTER 7 KEY ACTORS THAT LINK SUPPLY AND DEMAND IN FINANCING CATTLE FATTENING

The flow of finance is determined on the demand side by farmers as borrowers (Chapter 5) and on the supply side by Banks and other lenders (Chapter 6). However, a range of other institutions and actors play an important role in facilitating finance for cattle fattening. This structure and the actors involved are the focus of Chapter 7. Five different institutions are examined; Government agencies, Research Institutions, Agribusiness, Farmers' groups or Cooperatives, and Companies or other agencies. Each actor in this structure has a particular role in facilitating transactions between lenders and farmers.

As outlined in Section 4.1.4, the Government of Indonesia (GoI) has a proactive program to develop the beef industry in order to support a national plan for food security (Figure 4-3). One aspect of this over-arching policy is to support the development of cattle production through access to credit. The Government also actively encourages companies to invest in cattle production through grants or subsidies. However, these programs require the participation of other actors and it is important to understand the roles and functions of each as they can contribute to the success or failure of schemes. This learning from this investigation are important for the design and implementation of future schemes.

7.1. Role of Central and Local Government in Finance for Cattle Fattening

Central and Local Governments are key actors in supporting finance for cattle fattening in Indonesia, particularly in the development of policy, facilities, and technical services and assistance (Patrick et al. 2010). Particular government agencies make policy that impacts on the sector, delivers services, or encourages, incentivises or coerces other actors. As could be expected, there are clearroles and division of responsibilities between government agencies both horizontally and vertically.

7.1.1. Central Government

The credit programs (KKPE and KUR) have been established through three ministries in Indonesia; the Ministry of Finance (that provides the subsidy), the Coordinating Ministry for Economic Affairs (that establishes program credits), and the technical ministries such as the Ministry of Agriculture (MoA) (which implements the credit programs to improve the agriculture sector). These ministries collaborate in defining the scheme credit (Table 7-1) including the budget for particular commodities and schemes, subsidy types and amounts, and the coordination with the Banks involved in the schemes.

Table 7-1. The role of central government in financing cattle fattening

No	Actors	Roles
1.	Coordinating Ministry for Economic Affairs	- Establish the guidelines for program credits - Coordinate the implementation of KUR program with MoF, MoA
2.	Ministry of Finance	- Set up and provide the subsidised interest rate, the credit limit of loan disbursements - Determine banks to participate and the quota for each bank
3.	Ministry of Agriculture	- Determine commodities that can be funded by program credit - Identify and assist the small-, micro-, and medium entreprises (MSME) including farmers - Link MSMEs with other parties than can support their business.

The Coordinating Ministry for Economic Affairs is responsible for the implementation of programs created by Government. This Ministry sets up the guidelines and coordinates the program with MoF and other related Ministries with which this program will be implemented.

Additionally, MoF is responsible for funding the program which is granted from State budget revenues. This Ministry sets up the budget for subsidised credit and the targeted number of loans per commodity or Bank. This percentage is reviewed every year according to the progress in allocating credit. Moreover, this Ministry also has authority for the selection of Banks that can participate in the program.

The MoA has responsibility for determining the subsectors that can be funded. This Ministry through their working units has a role in identifying targeted farmers and assists them in operating their businesses. MoA also facilitates the connection between micro-small-medium enterprises (MSMEs) with other parties that can support their businesses. One Directorate with jurisdiction over livestock under the MoA (DGLAH) is involved in implementing these credit programs. This institution collaborates with the Local Government, especially with LSA, in every Province in Indonesia, including East Java (Section 7.2).

7.1.2. Local government

Since the government's decentralisation program, Local Governments in Indonesia have the authority to establish agencies to support local programs and policies related to animal husbandry, such as Livestock Services Agency East Java Province (LSA-Jatim) and The Executive Agency for Extension and Food Security (BP2KP). To support the

government credit programs, BP2KP and LSA have the same role as mentioned in Table 7-2.

Table 7-2. The role of local government in financing cattle fattening

No	Actors	Roles
1.	LSA-Jatim and BP2KP	- Inform farmers about credit programs and identify farmers that need financial support - Assist and support farmers with technical services or training in cattle fattening - Link farmers with other institutions (banks, research institutions) by providing a recommendation letter or assistance in loan applications - Distribute grants (subsidy inputs, veterinary services) to support farmers' businesses

First, LSA and BP2KP provide information about program credit to farmers and groups in their area. These agencies use their local knowledge and relationships to identify farmers who need financial support. Information about the farmers and farmers' groups is recorded and can be used by the Banks. In this regard, these agencies provide the first screening of businesses involved in cattle fattening for the Banks. However, for the credit schemes established by the Banks, promotion is done by the Bank itself, as with Bank Sinarmas in Tuban.

The second role of these two agencies is to provide technical assistance and services for cattle fattening, including reproduction, animal health, and feed. Activities include training, written materials, and farm visits with overlap sometimes between Agencies. This may stimulate social jealousy between farmers' groups, because the Institutions may work with the same farmers or farmers' groups.

More importantly, these two Agencies connect farmers with other agencies such as banks, research institutions, or other projects conducted by the Central Government. To access loans, farmers need to obtain a recommendation letter from the agencies as well as a certificate confirming that they have attended training. However, the Government agencies do not need to provide a recommendation for schemes established by the Banks or Cooperatives. In Tuban, BP2KP has been established as a technical standard for cattle fattening, with parameters for pens (with a concrete trough), ADGs (0.8-1.0 kg per day) and fattening periods (3-6 months), which are used by the Banks for their assessment. While the attainment of the standard does not ensure that loan applications will be successful, it does increase the confidence of Banks that loan applicants have attained knowledge and skill in cattle fattening.

In addition, assistance related to making a loan application such as completing the loan application form, business proposal, and cashflow budget is also provided by these

Agencies. However, farmers who are involved in active farmers' groups tend not to use these services and usually prepare loan applications together in a group. While the assistance by the Agencies can help farmers submit applications, it does not ensure that the farmers will obtain credit.

Another role of these Agencies is to coordinate and distribute Central and Local Government grants for concentrate (feed) for cattle, free medicines for worm control, and free artificial insemination services to support the farmers' businesses. For example, an active farmers' group in Plumpang Sub District, Tuban District received support through LSA including feed subsidies (in 2015), cattle through the Provincial cattle distribution program (in 2014), and equipment such as scales, a feed mixer, chopper, and biogas tanks, which are important for farmers to support their businesses.

A final government actor involved in financing cattle fattening in the study areas were Village Officials, who provide information on the character of farmers, including their borrowing histories, occupation, property, and relationships with family and others in the area. This is important to the Bank for their "character" assessment of farmers. This information is provided in the form of a recommendation letter and proof of residence. Village officials may also provide farmers with land title certificates that are used (as collateral) in the Five C assessment by the Banks (see section 6.4.3., Chapter 6).

7.2. The Role of the Research/Technical Agencies in Finance for Cattle Fattening

Two types of research and technical agency play a role in facilitating finance for cattle fattening in the study areas, namely those under the MoA and Universities.

7.2.1. Research Institutions

Under the MoA, IAARD is an umbrella organisation for several Centres and Stations that conduct research and development activities in agriculture, including livestock. Below IAARD, the Indonesian Centre for Animal Research and Development (ICARD) is focused on livestock and one of their Stations, the Beef Cattle Research Station (BCATRES) is located in East Java. BCATRES collaborates with LSA and another research and development institute, the Assessment Institute for Agricultural Technology (AIAT) that works particularly in the East Java Province as shown in Figure 7-1.

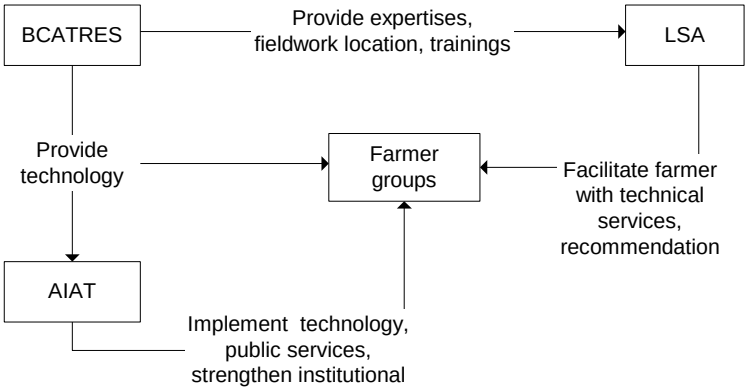


Figure 7-1. The role of research institutions in financing cattle fattening

As a Research Station, BCATRES conducts research and delivers technology such as feed mixes based on local resources that are important for farmer's business. They also provide farmers with publications and brochures in relation to different feed resources and criteria for good feeder cattle that helps farmers to manage their cattle and reduce the risk of failure. As a result, Banks will be more confident lending money to these businesses.

BCATRES also collaborates with LSA by providing expertise for the livestock training conducted by LSA, as well as a venue for farmers' field visits. This training is compulsory when applying for program credit (KUR and KKPE) from Banks. However, this Station does not help farmers directly with their loan applications, focusing more on improving cattle production. BCATRES also conducts workshops and invites stakeholders including Government Agencies (LSA), farmers, and commercial cattle producers to participate.

As an Assessment Institution, AIAT participates by providing technology and public services such as field visits, consultation, training, visitor plots, or other workshops in relation to cattle fattening. For example, in one village in the research area, AIAT built a visitor plot to demonstrate feed technology, fermented rice straw, so it could attract farmers to use their technology.

Another role for AIAT is to strengthen local institutions in East Java such as farmers' groups. Participation in a farmers' group is necessary to access or participate in government's projects including program credit (Patrick et al. 2010). AIAT collaborates with LSA to encourage the formation of groups and support activities by assisting with the creation of a group profile or preparing proposals as supplementary documentation for program credit (such as PMI, KKPE). Moreover, strong farmers' groups may open new connections with other projects. As an example, farmers in Plumpang Sub District, Tuban District, who are involved in several projects, also had an opportunity to interact with Bank Indonesia as a way of accessing credit.

However, in some cases especially for non-government credit, the role of these Research Institutes may be replaced by other research or technical agencies such as Universities or even cattle producers who are involved in the financing scheme.

7.2.2. Universities

Gadjah Mada University, the Faculty of Animal Husbandry plays an important role in financing cattle fattening in research area. The University has collaborated with PT Holcim Indonesia (Section 7.5.2) in Tuban, to develop an integrated farming system (HIFA) which supports cattle fattening in the region.

As a part of this collaboration, the University provides technical assistance on cattle management practices, feeding technology and animal health to farmers who have pens provided by PT Holcim. Representatives from the University are located in the company's pen area to monitor the ADG of cattle and help farmers to assess the profit of their business which is valuable information for Banks when disbursing loans. This assistance is also provided to farmers who operate outside the company's pens but still under the company's recommendations.

As a technical research agency, the University also provide feed technology and collaborates with PKM (Section 7.3.3), to produce a complete feed. In practice, the University provides feed formulations that can be produced on a large scale by PKM and they provide monitoring to ensure the quality of complete feed produced by PKM.

7.3. The Role of Agribusiness in Finance for Cattle Fattening

There are four types of agribusiness involved in cattle fattening in East Java namely traders, butchers, feed milling companies, and cattle companies. In the research area, those actors are particularly important in marketing. Facilitated markets provide some certainty for farmers and is a strategy to reduce business risk (Newbery 1989; Meuwissen et al. 2001).

7.3.1. Cattle Traders

There are two classes of trader according to area and size. The first group includes traders: 1) village traders where the operation is located in and around their village; and 2) sub district traders who have greater scope regarding the area for trading cattle. Based on size, there are small and large traders, determined by their capacity. Almost all traders are also cattle farmers, and a small proportion are butchers. Traders have pens, usually at their homes, to hold cattle as part of the trading activity. The Village trader is usually a

small trader selling a limited number of cattle, while sub/district traders are more commercial.

Village, sub district traders

Interviews with traders indicated that on average, traders in the study area sell about nine head of cattle every week with a profit of about IDR750,000–1000,000 per head (Table 7-3). However, the trading activities of village traders depends on their capital stock and experience. Traders with more capital are able to conduct a greater number of transactions. Experienced traders with close connections and a good reputation with sellers and buyers will also trade higher volumes than inexperienced traders.

Table 7-3. The characteristic of traders' activities

No	Parameters	Details
1.	Frequency to sell cattle	3 times a week
2.	Traditional markets	Babat, Bojonegoro, Bakalanpule, Tuban, Balungpanggang, Geminingrejo, Lamongan
3.	Number of cattle sold	5-9 head of cattle per week (2-3 cattle per market)
4.	Profit	IDR750,000 -1,000,000 per head
5.	Source of cattle	80-100% farmers 0-20% traditional markets
6.	Frequency of looking to find cattle	3-4 times a week
7.	Sales destinations	30-50% farmers; 40-60% traditional market; 10% butcher

Most traders buy cattle from farmers in their area or nearby as also reported by Fauzi and Djajanegara (2004); Mahendri et al. (2010); Patrick et al. (2010); Mahendri et al. (2012) and sell them at traditional live cattle markets. Traders usually have a close relationship with farmers, so it discourages the farmers from going to traditional markets.

Traders sell cattle to farmers directly (30-50%) especially farmers who do not have access to cattle markets. A few traders also sell directly to butchers. According to Waldron et al. (2013), butchers buy a large proportion of their cattle from markets.

Most traders use intermediaries (brokers) in traditional markets to handle each transaction. Brokers have a critical role to persuade the traders and buyers to complete a transaction (Patrick et al. 2010) and can be paid as a share of profits or by a flat fee (e.g. IDR50,000) per transaction. However, some well-known traders sell their cattle from their own house/holding yard without the need for a broker.

It could be expected that traders might provide loans to farmers, as occurs in three major village markets in Sikasso, Bittou, and Niangoloko West Africa (Williams et al. 2006). This occurs when farmers need capital to purchase cattle before they receive

payments for their seasonal turnoff of animals. Traders may give credit to farmers to lock them into a contract to secure supply when the animals are finished. However, they charge interest at a defined rate, often higher than bank rates, and typically deducted from the payments made to purchase the fattened animal.

The incidence of informal lending to cattle farmers was investigated in this study through interview questions. There was no evidence of informal lending by traders in the research areas. However, about 14% of traders in Tuban and 29% in Lamongan do assist farmers by providing capital in the form of cattle and enter into a profit-sharing (Gaduhan) arrangement. They usually collaborate with family, neighbours, or trusted people and share the profit equally. If they share input costs, pen and feed costs, for example, are covered by the farmer and remaining costs such as veterinary expenses are paid by the trader. However, if the farmer pays all the cost, they may receive 60-70% of the profit. This percentage is lower than the cost of credit which is about 3-5% (Section 5.4.2) and can be attractive as it avoids the complicated bank application process for a bank loan.

Commercial traders

In addition to small traders, there are Commercial cattle trader such as PT Dua Berlian Mandiri (DBM) that operates in East Java and plays a significant role in financing cattle fattening, especially in Tuban (Figure 7-2). This trader collaborates (under contract) with the Banks (BRI, Sinarmas) and PT Holcim Indonesia (Section 7.5.2) to support cattle fattening businesses. The case studies describing this scheme will be discussed in Sections 8.5.1 and 8.7. However, in some cases this trader does not partner with farmers who are involved in government credit programs or farmers who apply individually.

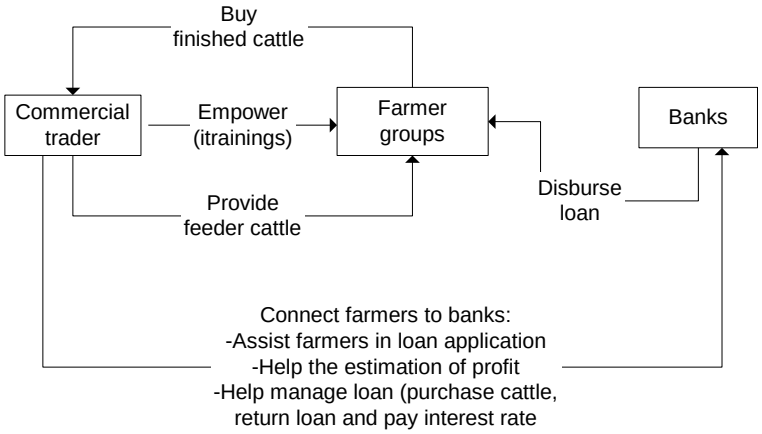


Figure 7-2. The role of PT DBM in financing cattle fattening

The principal role for this commercial trader is to connect farmers with sources of feeder cattle, as well as providing certain market for finished cattle. By making an

agreement with a cattle trader, farmers feel more confident about the market as they have limited information about preferences and prices for cattle (Koesmara et al. 2015). In some instances, the price a farmer receives from village traders will be low making a contract with a commercial trader more profitable. This is another issue of interest to banks when disbursing loans to farmers.

PT DBM may also link farmers with banks or other lending institutions as their relationship with farmers allows them to identify and recommend successful farmers. BRI and Sinarmas Bank have agreements with this commercial trader, who can act as a guarantor, but in this case, farmers still need to provide collateral to access credit. Like other agency assistance, commercial traders may also assist with loan applications and documentation to support applications. They may also help farmers manage credit, such as calculating how much money should be spent to purchase feeder cattle and repayments, which is especially helpful for farmers who lack education.

Commercial traders work with other agencies such as PT Holcim to empower farmers through training about choosing and keeping cattle and feed management. This is also beneficial to the trader as has a positive impact on the quality of finished cattle, providing high recovery rates per carcass.

As with other traders, this supplier buys cattle from local markets based on a visual estimation of cattle weight. They usually select cattle with a body weight of more than 350 kg, so the price will be cheaper. This is because of a difference in price between medium cattle (less than 350 kg) and larger cattle (more than 350 kg). Moreover, cattle traders also buy cattle from other traders (agents) often with weighing systems. The trader will determine the price per kg of the cattle (about IDR42,000/kg at the time of survey), so they can estimate potential profit after selling those cattle to contracted farmers at IDR45,000/kg.

Under contract with BRI, PT DBM has already traded about 150 head of cattle for farmers in five months (Section 8.5.1). Of this number, around 21-30 head per week, went to farmers with credit from the Sinarmas Bank, while the rest are provided for farmers with credit from BRI in collaboration with PT Holcim. This commercial trader also supplies to and buys cattle from farmers or other traders without an agreement using visual estimation to determine the price of cattle. It is suggested that these farmers make a contract with the supplier to get a certain price.

Farmers who want to buy cattle from this trader can choose the cattle directly from their pen. If this commercial trader cannot sell the cattle, they will fatten the cattle themselves and sell them to butchers in Surabaya District and Jombang. The number of

cattle sold per day to each outlet is about three and seven head, respectively. If the body weight of the finished cattle from farmers has not reached the weight required by the butcher (about 600 kg), the trader will sell those cattle to other contracted farmers again until the appropriate body weight is obtained.

7.3.2. Butchers

As Butchers do not provide credit to farmers they are not considered actors in financing cattle fattening. Further to this, they do not have long-term contracts to buy cattle from farmers that might increase certainty of price for the Banks to consider. Since there are cattle available in the markets every day, butchers are able to find their daily needs (Patrick et al. 2010) without the need to enter into contractual arrangements with farmers.

There are several types of butchers in the area of research. Some butchers specialise in slaughtering and butchering, while others also trade cattle. Some butchers buy cattle outright and sell beef and offal into markets (usually wet markets), while others slaughter for a fee (typically in the form of by-products such as tail, offal, bones, hides).

Different to traders, butchers conduct their business activities almost every day. Most butchers slaughter 1-2 head per day depending on the size of cattle but this increases in peak season such as Eid-fitri or other religious events (Mahendri et al. 2012). Butchers usually have established customers in the wet markets or who buy from the slaughter house.

Butchers buy cattle from markets (70%) and farmers (30%). Farmers usually sell cattle to butchers when the cattle are sick to ensure a return from a damaged product (Patrick et al. 2010). Due to capital constraints, butchers do not usually pay for the cattle on purchase, but rather pay after the product has been sole (up to one week) and before the next animal is purchased from the same seller.

7.3.3. Feed Mills under CSR

Initially, contracts between farmers and feed mills were created due to problems that occurred with cattle fattening businesses. They included: 1) the high feed cost and limited access to feed resources; and 2) lack of farmers' skills or technology to process their own complete feeds. There are various feed mills within the research area such as Munir Jaya and Wiji Jaya but three feed mills play a significant role in financing cattle fattening, the Community Centre (PKM), the Cooperative (Section 7.4.2), and an integrated beef cattle company (Section 7.3.4).

PKM was established in 2011 as an organization to evaluate and monitor community development programs such as the community grants established by PT Holcim Indonesia (Section 7.5.2). After several iterations, PKM became involved in managing CSR funds from Holcim which supported cattle production and other livestock activities.

In 2016, PKM was managed by representatives from six villages called Ring 1 including three villages within the research area (Sawir, Kerek and Karangasem). They started collaborating with DFAT (Section 7.5.3) and the University (as mentioned in Section 7.2.2) to produce and supply a complete feed which is made from agricultural by-products including palm kernel, rice bran, peanut skins, rice straw, and soybean meal. Feed products include AA01 (9%protein, IDR2,000 per kg); AA02 (12% protein, IDR2,200 per kg); and AA03 (14% protein, IDR3,500 per kg). AA02 is the most popular among farmers. Feed is distributed around Tuban, including the study site Lamongan (in Paciran and Brondong Sub District). Feed production varies from about 50 tonnes per day during dry season down to 27-28 tonnes per day during the wet season. Production is higher in the dry season to meet demand from farmers when farm grass and forage production is lowest.

PKM also has a role in providing feed, linking farmers with Banks, empowering them and assisting farmers in loan processing and management (Figure 7-3), in relation to the PT Holcim financing scheme. Other farmers with no relationship with PT Holcim may have the opportunity to be linked to Banks if they collaborate with PKM in feed marketing (as their agent). This is because PKM, as a commercial trader, also participates in identifying potential farmers and providing recommendations for finance.

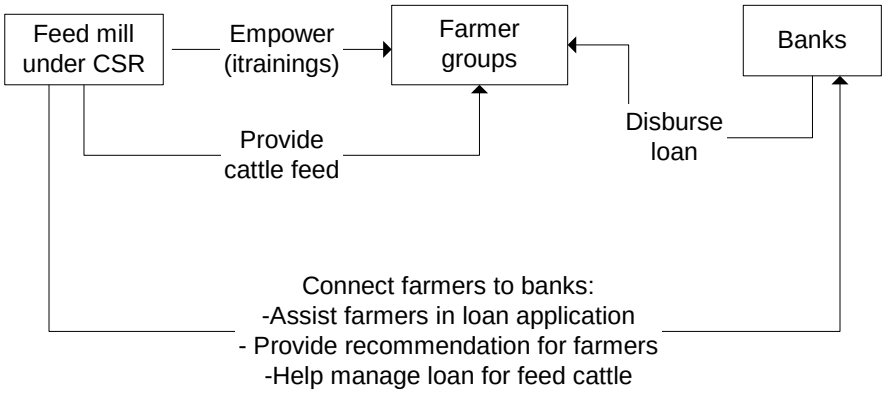


Figure 7-3. The role of PKM in financing cattle fattening

PKM has a formal contract with farmers who apply for bank loans to supply cattle feed. They ensure the availability of feed, so farmers just need to focus on their business. The contract price of cattle feed depends on the type of feed chosen by farmers.

Another role for feed mills is to help farmers submit applications and manage their loans. PKM helps farmers to estimate the amount of feed they will need and the Bank will directly transfer the money to the Feed mill to ensure that farmers use the loan for this purpose.

Together with commercial traders and the company, PKM also empowers farmers by providing training related to feeding management. This is important for farmers because feed is a crucial aspect influencing ADG of cattle which impacts on the profit of the business.

7.3.4. An Integrated Beef Cattle Company

Another agribusiness actor that links with farmers (and with implications for credit) is the integrated cattle company PT Wahyu Utama, located in Tuban. This company has a feed mill, raises calves (although this done for policy reasons), has a feedlot, cattle marketing, cattle slaughtering, beef trading, and a restaurant. The feedlot started in 1992 holds about 2000 head of cattle, including 600 cows and 1400 bullocks of about 350-500 kg.

Initially, the owner of the company built the pens on rented land and fattened other farmers' cattle in a profit-sharing arrangement (gaduhan). At the same time, the feed mill was developed to reduce feed collection costs and increase weight gains. In 1994, the operation extended to the purchase of fattening cattle and with a loan facilitated by a well-off contact.

Of particular interest in this thesis, the company connects with farmers as follows. The company buys all cattle from the market. The owner does this himself because of the skill and experience required to buy cattle with high fattening potential, at a price lower than it sells the cattle to farmers (in 2016, IDR45,000 per kg). The owner buys cattle three times per week at markets (Jatirogo, Tuban and Kerek or sometime in Bojonegoro), and buys 8-13 head of cattle per day. They then sell cattle to farmers under a partnership agreement. This partnership is important beef to the company feedlot by facilitating farmers to fatten their cattle (Tawaf et al. 2011). The company has partnerships with about 100 farmers from 17 villages through a program extending over a period of up to three years, while several farmers have entered into several contracts.

Before building the partnership, this feedlot also facilitates training for farmers in improving their knowledge in cattle fattening management that is also important in "capacity" assessment for the banks. In this case, they collaborate with a research institution (Section 7.2.1) to access the training expertise.

Wahyu Utama also supply feed resources and complete feeds to contracted farmers, but this is not compulsory as a part of the partnership program. However, most contracted farmers buy feed resources from this company and mix it themselves based on this training.

To help farmers connect with banks, this company acts as guarantor for getting loans from banks. The recommendation from Wahyu Utama is important for the bank, however farmers have to provide their own collateral and reassure the banks (currently Mandiri, BRI, Bank Jatim, and Sinarmas) of their credit-worthiness. Waldron (2014) reported that the constraint on farmers in entering a contract with this company is the ownership of a land certificate (collateral for the bank).

As part of this link to banks, this company also supports farmers in processing their loan applications. Company staff assist farmers with the loan application and proposals, including a group profile and cashflow analysis (required for some credit schemes such as KKPE). The roles of this company were confirmed by Rondong (2014) who suggests they expand the number of contracted farmers who accessed credit which can enrich the farmers with credit information from financial institutions.

The farmers will usually fatten their cattle for four months and sell them back to the company which pays a price determined in the contract. It is similar to the price when they sold cattle to the farmers. However, when the prevailing market price increases, the company will share the margin between market price and contract price with the farmers. If the market price decreases, the company pays at the contract price.

The number of cattle sold is about 100 head per month to farmers in Kalimantan, Lampung, Jakarta, and East Java. If those cattle are not chosen by farmers, they are retained and slaughtered by the company. The number of cattle slaughtered is about 2-3 head per day, then they are sold to the traditional markets in Bancar and Rembang (90%) and the remainder sent to the company's restaurant (10%).

7.4. The Role of Farmers' Groups and Cooperatives in Finance for Cattle Fattening

Farmers' groups and cooperatives are an important structure in financing fattening operations. Like the broader farming system, there are strong relationships between cattle fattening households and this relationship can be expanded to a more formal structure in a cooperative.

7.4.1. Farmers' Groups

During the survey, 65% of the cattle fatteners interviewed were involved in a farmer's group. Farmers who formed a group had the same needs and aimed to increase their incomes. Moreover, formation of a group is an eligibility criterion for Government programs (Patrick et al. 2010), including program credit (see Section 6.4).

There are several types of farmers' group in the research areas, categorised as developing and developed farmers' groups. The first group consists of farmers who are active and enthusiastic to expand their cattle fattening activities but have limited ability to do so, and usually lack inputs, so they need to be actively supported by other parties. In the developed group, farmers have been operating independently in the cattle business (have at least experience of one cycle of fattening) and have a strong need to enhance their group become independent group. For example, a farmers' group in Jenu Sub District, Tuban District initially consisted of about ten farmers (it now has 40 members) and their focus is on cattle (male and female cattle), but only 11 of these farmers feed their cattle intensively (using complete feed, so called concentrate).

Farmers' groups also play a part in financing cattle fattening by providing assistance to members with loan applications which is particularly important for those with limited education. Being in a group can reduce transaction costs by reducing the cost of lodgement (transport) and processing. Banks can also arrange to meet farmers in one place as group members tend to live in close proximity. By placing bulk orders, the group may gain lower costs on inputs, transport of inputs, and later cattle.

In some cases, the group does not function properly because farmers formed the group to access a program. However, there are also cases where groups have facilitated the redistribution of loans. For example, in Plumpang Sub District, Tuban District, where the a who takes out a loan but cannot use the full amount (e.g. half of IDR50 million). The group can distribute the remainder to other farmers who are seeking capital but who have not taken out a loan themselves. In this case, the repayment to the bank is also managed by the farmers' group. The group will calculate the expenses of each farmer (for cattle, feed, interest, and their loan), their surplus, and their repayment to the bank. At every group meeting, the leader will show the position of each farmers' expenses.

7.4.2. Cooperatives

Different to farmers' groups, a cooperative is a formal institution under Regulation No. 25, 1992 (the principles of cooperatives and legitimised by Ministry of Cooperation and Small and Medium Enterprises (KKUKM) which facilitates the needs of all members,

not necessarily limited to cattle production. There is one Cooperative in Palang subdistrict, Tuban District that supports cattle fattening. This Cooperative was established in 2014 with 126 farmers (almost 80% of the target) from six sub-districts. The Cooperative consists of two units; the business unit that manages production and marketing activities, and the savings and loans unit that manages capital for farmers.

The source of capital is from members (principal savings IDR50,000 and monthly savings IDR10,000) and CSR funds from PT Exxon (Section 7.5.1) which is about IDR1.1 billion. PT Exxon also provides office equipment such as computers, safety box, laptops, and supporting material. Capital can be accessed by farmers for their agricultural businesses (food crops, fishery, or livestock), or private needs. For cattle fattening, members have to apply as a group (see Case Study in Section 8.5) with an administration cost of 0.8% of the total loan, and an interest rate of 0.8% per month. For personal loans the interest rate is 1% per month.

The Cooperative also has several roles in the development of cattle fattening business in the area (Figure 7-4).

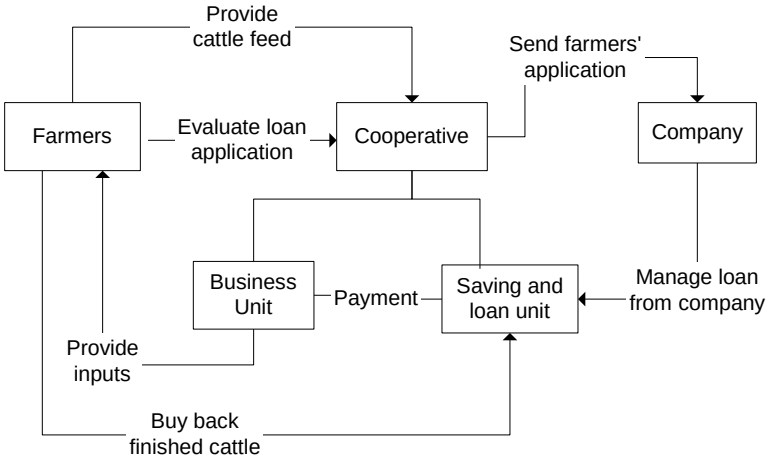


Figure 7-4. The roles of a cooperative in financing cattle fattening

Through their saving and loans unit, this cooperative provides farmers with access to credit. Farmers as a group are required to submit a loan application, which the Cooperative evaluates and assists to finalise the application. The Cooperative may provide a recommendation and approve the farmers' application before it goes to the Company. At the time of survey, the source funding was through PT Exxon CSR funds.

Once the loan is disbursed, the Cooperative purchases cattle and feed and manages finance costs. In some cases, the loan is managed by a farmers' group or directly by suppliers who have contracts with farmers as in Schemes 5 and 6 (Section 8.6 and Section 8.7).

The Cooperative connects with suppliers, such as Wahyu Utama (Section 7.3.4), to supply the farmers' needs and will look to expand collaboration with other companies (such as PT Munir) allowing the farmer to concentrate of cattle fattening. At the time of sale, the Cooperative sells the cattle and distributes profits after costs.

7.5. The Roles of Companies and Other Agencies

In Tuban, two oil and cement companies, PT ExxonMobil and PT Holcim Indonesia, also collaborate with other agencies to contribute to the communities around them.

7.5.1. PT Exxon Mobil

PT Exxon Mobil is an oil and gas company with oil refinery operations in Tuban. Participation in their CSR program is a way for the company to manage socio-economic impacts and public relations in the area. In Tuban, those areas include six villages, namely Trutup (Plumping Sub District), Gesing (Semanding Sub District), Glodok (Palang Sub District), Palang (Palang Sub District), Leran Kulon (Palang Sub District), and Karangagung (Palang Sub District).

The group that has managed the CSR program since 2013 was called "Community Self-Help" (BSM). This organisation identified six groups from six villages called the Self-Help Group (KSM) to be involved in the projects managed by BSM particularly in relation to finance and business. In 2013 to 2017, the four sub sectors funded were livestock (especially cattle and goats), food crops, fisheries, and food processing. The biggest allocation of funds was for livestock, distributed to Glodok, Leran Kulon and Gesing villages. This study will just focus on CSR funding for livestock in three village in Tuban (Figure 7-5).

According to the interview, PT Exxon supports cattle fattening in these areas by providing capital (CSR funds) to fatteners through BSM and/or a Cooperative. The loan application is evaluated by the company and if it meets requirements, funds are disbursed. These funds are grants and don't require repayment. Moreover, PT Exxon provides training for farmers, inviting expertise from Universities and collaborates with PT Wahyu Utama (see Section 7.3.4.).

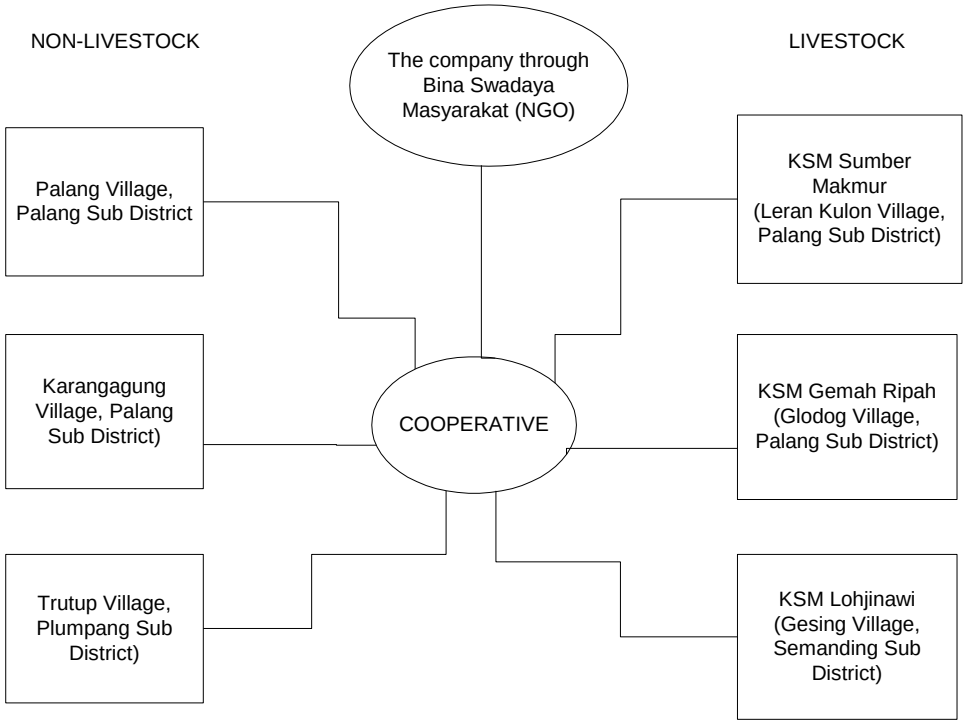


Figure 7-5. The four subsectors funded by CSR funds from PT Exxon

7.5.2. PT Holcim Indonesia

PT Holcim Indonesia operates in mining resources and produces cement. As these activities which might impinge on farmers' lands, the company provides CSR funds to support the community within their operational area. PKM manages the CSR fund (Section 7.3.3) and the company collaborates with Gadjah Mada University (Section 7.2.2) to assist cattle fattening farmers in their region.

Since 2014-2015, there were about 139 farmers from three villages in the research area (Section 7.3.3) involved in this program. Those farmers were chosen by PKM (Section 7.3.3) and DBM (Section 7.3.1) as a partner for the company. From among those farmers, about 40-50 were classed as developed farmers and the rest of them are growing farmers (Section 7.4.1).

PT Holcim connects farmers with one of the lending institutions (BRI) and acts as a guarantor for farmers as shown in Figure 7-6. This company provides the recommendations for farmers and collaborates with DFAT (Section 7.5.3) in linking farmers with Banks (Sinarmas).

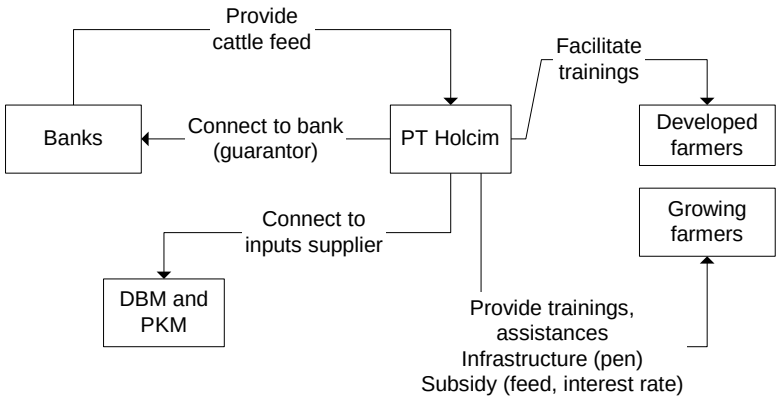


Figure 7-6. The roles of PT Holcim in financing cattle fattening in Tuban

The company also connects farmers with input suppliers (PKM and DBM as discussed in Section 7.3.1 and 7.3.3). These connections ensure the availability of inputs and access to an output market, so it reduces the risk of failure. These contracts are developed between PT Holcim, Banks, PKM and DBM. The company also conducts training, sharing the cost with DFAT. All farmers around the company site get the same opportunity to attend training. From that, they classify farmers into developed farmers (independent but lacking capital) and growing farmers (need full support in cattle production). For growing farmers, PT Holcim provides infrastructure such as pens with the capacity for 320 head cattle, assistance, subsidies for cattle feed, and subsidised interest rates. The interest subsidy helps growing farmers who may generate less profit, due to a lack of experience and knowledge about keeping cattle, affecting loan repayments. The Case Study in Section 8.5.1 and 8.7, relates to this arrangement.

7.5.3. DFAT

The Australian Department of Foreign Affairs and Trade (DFAT) has experience in rural development in Indonesia and established the AIP-Rural program including PRISMA (Promoting rural incomes through support for markets in agriculture), SAFIRA (Strengthening agricultural finance in rural areas) etc. (DFAT 2015, 2017). PRISMA and SAFIRA programs aim to increase small-holders' incomes. While PRISMA identifies financial opportunity in selected agricultural sectors, SAFIRA focuses mainly on micro finance organisations to deal with farmers' access to credit. The SAFIRA project facilitates value chain financing between private banks and farmers.

Through these projects DFAT provides assistance for farmers related to improving capability of farmers in cattle production. Moreover, these projects link farmers to Sinarmas Bank.

7.6. Implications of Thesis Findings

Farmers have a better opportunity to access credit when engaging with key actors in the sector. At the same time, it also decreases the risk for lending institutions. In some cases, the key actors will work together to connect farmers and banks, while in other cases, particularly in relation to Government programs, some actors have less involvement in these financing schemes. Sometimes the roles of each actor appear to overlap, therefore coordination between them is critical, as is the establishment of trust between key actors and lending institutions.

CHAPTER 8 FINANCE SCHEMES FOR CATTLE FATTENING

The combination of different actors on the demand side (farmers), supply side (the Banks) and intermediate agencies (Chapter 7) leads to a range of different types and models of financing schemes available for cattle fattening. Six models are identified and examined in this Chapter. After summarising the characteristics of the six different finance schemes (Section 8.1), each scheme will be examined (Section 8.2 to 8.7) with the following structure. First, the types of loans that farmers have accessed will be outlined. Second, the way that this effects the costs and revenues of the farmers will be outlined through cashflow and budget analysis. Third, the strengths and weaknesses of each scheme will be assessed based on criteria such as sustainability, access, alignment with program objectives, market risks, and profitability. These criteria are used to assess and suggest improvements to the finance schemes.

8.1. A Typology of Financial Schemes

Six models of financial schemes that provide credit for cattle fattening were identified in Tuban and Lamongan. Factors used to categorise the schemes were the type of farmer, the type of lender, agencies that link the parties, and the type of guarantor (Table 8-1).

Table 8-1. The characteristics of six credit schemes accessed by farmers in research areas

No	Type of Loan applicant	Location	Type of credit scheme	Lender	Linking actors	Guarantor
1.	Individual/ group	Tuban Lamongan	KKPE	Commercial Bank	-	Government
2.	Farmer group	Tuban	KUR	Commercial Bank	Cattle producer, LSA, research institution	Cattle producer
3.	Farmers' group	Lamongan	PMI	Rural Bank	-	LSA
4.	Farmers' group	Tuban	CSR	CSR	Cattle producer, cooperative	Cattle producer, farmer group
5.	Developing farmers' group	Tuban	KKP	Commercial Bank	Feed mill, commercial trader, company	Company
6.	Developed farmers' group	Tuban	Simas agri	Commercial Bank	Feed mill, commercial trader, company, DFAT	Feed mill, commercial trader, company

There are several types of cattle fattening enterprise that take out loans. About 23% of farmers apply as individuals and the rest (77%) apply through farmers' groups. Farmers in Tuban, unlike Lamongan, enter contracts with trusted buyers and input suppliers while loans are taken from various sources including Banks, Companies, and the Government.

8.2. Scheme 1. Individual or Group Access to Credit without Agribusiness Links

Whether farmers access credit as individuals or in groups depends on the program they are applying for. Under Government regulations, KKPE can be accessed by individuals or groups (Direktorat Pembiayaan Pertanian 2014a), while KUR can only be accessed by individuals (Widiyanti 2018). Money is lent by Commercial Banks, but the interest payments are subsidised by the Government. Farmers in the KKPE scheme obtain credit with the characteristics outlined in Table 6-5. In this type of scheme, there are no links with agribusiness actors, but letters of recommendation from Local Government are required.

8.2.1. Lending Processes and Linkages for Scheme 1 Loans

Requirements to obtain credit

Like other types of loans, considerable documentation is required when applying for program credit (as discussed in Table 6-7, Section 6.4.1). Borrowers provide collateral, generally in the form of a property/land certificate. Under program credit, farmers need to provide proof of attendance at livestock training and show evidence during a site visit of standard pens with concrete troughs, as well as cattle ownership.

Linkages/institutional arrangements

Three actors are involved in the loan application process: Farmers or a group as applicants, the Livestock agency (LSA or BP2KP), and the Bank (Figure 8-1). Applicants require a recommendation letter from the Livestock agency and proof of residency, and a business certificate (Arrow 1) from village officials.

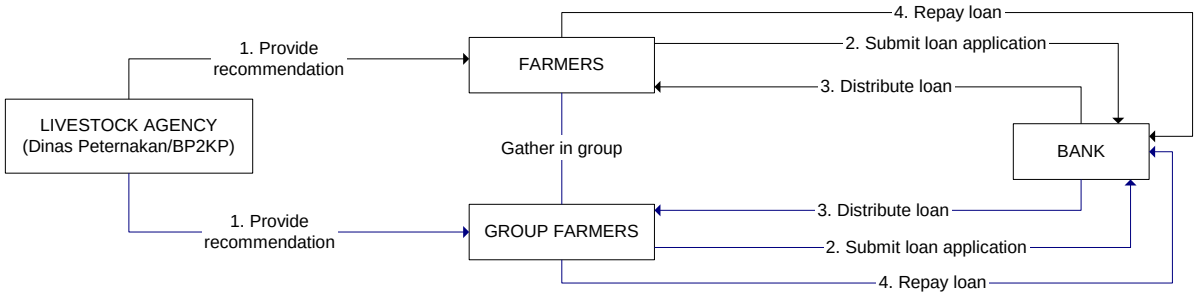


Figure 8-1. Links in credit application procedures for Scheme 1 loans

Completed documents are submitted to the Bank for assessment (Arrow 2). The processing time is usually 7-14 working days but can be longer if documents are incomplete or there is a long waiting list of applicants. It may take as long as four months. Once approved, the next step is to distribute money into farmers' bank accounts (Arrow 3).

The Bank does not specify how the loan funds will be used as long as it is for cattle fattening.

Some issues of timing arise in the lending process. For example, at the time farmers receive the capital, purchase prices for cattle may be high, or after the fattening period, sales prices may be low (due to seasonal and demand factors). Skilled farmers try to time their purchases and sales around these market patterns, but they can be misaligned with loan periods. Future refinements of the system should ideally align loan periods with the market and fattening cycles targeted by farmers.

Loan repayments

Loan repayment (Arrow 4) is the liability and responsibility of each farmer, even when applying as a group. Repayment periods are based on production cycles, which are usually six months. However, the repayments depend on the contract with the Bank.

There are two types of loan repayment system with this scheme. In type 1, farmers who access loans for four fattening periods over a two-year period receive the loan annually (IDR100 million) and must return 50% of the principal with interest every 6 months. If farmers do not want to continue the loan into the second year, they can withdraw. However, in repayment type 2, interest rates are paid at the end of each six months fattening period, and principal is repaid at the end of the year. This repayment terms appear more appropriate than Type 1. Even though the lent amount received by farmers in Type 1 is higher than in Type 2 (over a period of 6 months), farmers cannot use all this money to expand production because of other limits on the farm (pens, feed, labour). As a result, farmers are tempted to use residual amounts of these loans for other purposes.

With both Type 1 and 2 loans, farmers must re-apply in the second year. While this can increase certainty for Banks, it can disrupt their business operations. The second application is typically easier with a processing time of only 1-2 working days because documents and other requirements have already been provided. However, a new recommendation from the Livestock agency is required and Banks review the repayments made and performance of the earlier loans.

8.2.2. Budget Analysis of Scheme 1 Loans

The different types of credit schemes have implications for the profitability of the cattle fattening business. This will vary due to different arrangements (period of time money is borrowed), different loan arrangements (amounts to purchase cattle, feed, and interest rates), and the existing agribusiness actors who provide set prices that reduce the

risk to Banks in disbursing credit. Therefore, a budget analysis of each scheme is necessary to indicate whether the scheme is efficient and can increase farmer income.

The budget analysis for this scheme is based on data from two farmers' groups in Tuban that received subsidised credit from Commercial Banks (BRI, BSM, Bank Jatim). The major parameters in the budget analysis are presented in Table 8-2.

Table 8-2. Budget analysis for fatteners involved in Scheme 1 loans

No	Parameters	Cashflow	Full Budget
	Number of days in fattening period (days)	150	150
	Number of cattle fattened (head)	3	3
A	**Revenue**		
1	Finished cattle sold (IDR)	64,680,000	64,680,000
2	Manure revenue (IDR)	-	360,000
3	Biogas revenue (IDR)	-	-
	Total revenue	64,680,000	65,040,000
B	**Non-Capital Costs**		
1	Feeder cattle (IDR)	53,400,000	53,400,000
2	Labour (IDR)	-	3,750,000
3	Veterinary services (IDR)	336,000	336,000
4	Feed (IDR)	4,960,575	6,319,950
5	Manure (IDR)	-	60,000
6	Depreciation of biogas installation (IDR)	-	-
7	Depreciation of pen costs (IDR/year)	-	316,220
8	Other costs (IDR)	170,000	170,000
a	Communication (IDR)	20,000	20,000
b	Transportation (IDR)	150,000	150,000
9	Weight loss (IDR)	-	-
a	Purchase loss (IDR)	-	-
b	Sale loss (IDR)	-	-
	Total Non-Capital Costs	58,866,575	64,352,170
C	**Gross profit per fattening period**	5,813,425	687,830
	Gross profit per head per day	12,918.72	1,528.51
	Gross profit per day	38,756	4,586
D	**Capital Costs**		
1	Interest per period (IDR)	1,500,000	1,500,000
2	Application cost (IDR)	362,500	362,500
3	Opportunity cost of own capital (IDR)	-	1,139,677
	Total Capital Costs	1,862,500	3,002,177
E	**Net profit per fattening period**	3,950,925	-2,314,347
	Net profit per head per day	8,780	-5,143
	Net profit per day	26,340	-15,429

Feeder cattle price

A household may hold on average three head of cattle due to limited capacity of the pens and capital of farmers. It is assumed that farmers buy cattle at an average price about IDR17.8 million with the assumption that feeder cattle prices are about IDR50,000/kg. The price of cattle is calculated based on a visual weight estimate, and with that price, it is estimated that the initial weight of cattle is about 356 kg.

Farmers' groups generally feed cattle for 6 months with an ADG of 0.8-0.9 kg/day, however in this scheme, the fattening period is five months. This might impact on the capital cost (interest rate), which has to be paid for six months for each lot of cattle fattened and may affect the net profit generated by farmers.

Finished cattle price

In Scheme 1, farmers sell finished cattle from their pens. Between 2-5 village traders will come to the household, and farmers will accept the highest price. The time for selling cattle will be different between members in the group depending on their needs. Based on the survey, the price of finished cattle is also based on a visual estimate of weight, which was on average IDR21 million per head. The selling price of cattle is assumed about IDR44,000 per kg.

Manure price

The production of manure is assumed to be 10 kg/per head per day. While manure is not sold by farmers, it is used on their own land and the price used to estimate value is based on market rates. A large farmer in Lamongan sells manure to a local fertilizer company for IDR400,000 per truck load of 5 tonnes. Two persons are required to load the truck at a cost IDR30,000 per person.

Labour costs

While the farmers do some training (and borrowing) activities as a group, they manage cattle independently in their own pens. A family member will collect and feed the cattle and clean the pen. Family members are not paid for this work, so the cost of labour is not included in the cashflow. However, for the profit analysis, opportunity cost of labour used is about IDR25,000 per day.

Veterinary costs

Farmers incur costs in treating cattle with vitamins and for worms. Based on the data from the survey, vitamins are given once per fattening period (IDR12,000 per tablet per

head) while anthelmintic is given every month (IDR10,000 per tablet). On average farmers call veterinarians to monitor their cattle once per fattening period at a cost of IDR 50,000. In total, veterinary cost is estimated about IDR747 per head/day.

Feed costs

Cattle in Tuban are fed crop residues of native grass, rice straw and rice bran, supplemented with salt, molasses, and sometimes elephant grass. The price of each resource is assumed as those mentioned in budget analysis for representative households in Section 5.4. The amount of feed is based on survey data shown in Table 8-3. Different from the representative households, cattle are fed for only 5 months which may influence the non-capital cost.

Table 8-3. Feed costs in Scheme 1 loans

No	Parameters	Cashflow	Full Budget
1	Total feed cost (IDR/head/period)	1,653,525	2,106,650
a	Total native grass (IDR per head/period)	-	125,000
	Amount of native grass per day (kg/head)	16	16
	Price of native grass (IDR)	-	104
	Number of days	75	75
b	Total elephant grass (IDR per head/period)	-	131,250
	Amount of elephant grass per day (kg/head)	7	7
	Price of elephant grass (IDR)	-	625
	Number of days	30	30
c	Total rice straw (IDR per head/period)	-	196,875
	Amount of rice straw per day (kg/head)	7	7
	Price of rice straw (IDR)	-	375
	Number of days	75	75
d	Total rice bran (IDR per head/period)	1,462,725	1,462,725
	Amount of rice bran per day (kg/head)	5	5
	Price of rice bran (IDR/kg)	2,167	2,167
	Number of days	150	150
e	Total salt (IDR per head/period)	22,800	22,800
	Amount of salt per day (kg/head)	0	0
	Price of salt (IDR/kg)	800	800
	Number of days	150	150
f	Total molasses (IDR per head/period)	168,000	168,000
	Amount of molasses per day (liter/head)	0.2	0.2
	Price of molasses (IDR/liter)	7,000	7,000
	Number of days	150	150

Pen costs

The pen cost is not included in cashflow analysis, while the profit budget includes depreciation. The average cost of building a pen in Scheme 1 was IDR7.6 million. It can be used for 10 years, so depreciation per fattening period is IDR316,000.

Credit costs

The annual interest rate of program credit (KKPE) is 6%, while other finance costs are administration (IDR300,000) and building insurance (IDR300,000 for two years). The full budget analysis includes an opportunity cost for own capital, based on the interest earned on a term deposit with BRI, which is about 4.25% per year. This cost is only calculated for total non-capital costs (feeder cattle, feed, veterinary, labour, transportation, weight loss, communication, and depreciation of pen).

Other costs

Other costs include transport and communication, and these are assumed to be those of a representative household in Section 5.4. The cost to transport purchased feeder cattle from market to the farmers' home is about IDR50,000 per head, but there are no costs in selling finished cattle, sold to traders at the farm gate. Communication costs (phone calls to suppliers, veterinarians, feed supplier, etc.) are assumed to be IDR20,000 per period.

Profitability

With this scheme farmers generated a cash surplus of about IDR26,340 and profit of -IDR15,429 per day. The profit is negative in the full budget, as it includes labour, and other opportunity costs such as feed. Sukanata et al. (2014) reported that fattening Bali cattle in Buleleng district, Bali-Indonesia is not feasible if all cost components are included. However, this business is attractive for farmers because they do not pay for feed found on the farm or field. The profit earned from cattle is lower than other farming activities (IDR50,000 per day).

In this scheme, farmers can reach ADG of 0.8-0.9 kg/day, and this has a positive effect on profit. It is likely that the training in cattle production will enhance the capability of farmers to manage their cattle.

Even though the fattening period is 5 months, farmers still pay the interest rate for 6 months, which decreases the profit. If the amount of interest rate paid aligns with the fattening period chosen by farmers (5 months), this can increase the cash surplus to about 6% and profit to 11% (full budget). With this scheme, there is a possibility of a delay to the

start of the loan which might not align with the seasonal price of cattle in the market, and this will impact on profit (Table 8-4). Profits are sensitive to both the price of feeder and finished cattle, and a change in those prices contribute significantly to change to profit (more than 100%). It is suggested that the disbursement of loans needs to be aligned with prices in the market.

Table 8-4. Net profit without subsidised credit, and delay in loan timing

No	Parameters	Net Profit (IDR/day)	
		Cashflow	Full Budget
	Subsidised vs non-subsidised credit		
1	Subsidised credit	26,340	-15,429
a	Commercial interest rate13%	14,673 (-44)	-27,096 (-76)
b	Commercial interest rate 15%	11,340 (-57)	-30,429 (-97)
2	Delay on loan, indicated by		
a	Increase of 10% in feeder cattle price	-9,261 (-135)	-51,659 (-235)
b	Decrease of 10% in finished cattle price	-16,781 (-164)	-58,549 (-279)
3	Combined (1b, 2a, 2b)	-67,381 (-356)	-109,779 (-612)
4	Loan timing aligned with fattening period	28,006 (6)	-13,762 (11)

Note: Figures in ( ) are percentages

The profitability of the scheme increases because of the interest subsidy. If there is no subsidy, and farmers have to pay the full interest rate (13-15%), the surplus is significantly reduced, cashflow by about 44-57% and 76-97% reduction in profit (full budget). It is still profitable under the commercial interest rate for the cashflow but not for the full budget (Table 8-4).

The cattle fattening business using Scheme 1 loans faces an inefficient marketing system, with a lack of access to markets, high transport costs due to small-scale production, prices determined by buyers ignoring cattle weights, and the cost of brokers, which will reduce farmers' profits (Koesmara et al. 2015).

8.2.3. Assessment of Scheme 1 Loans

This Section will discuss Scheme 1 further, addressing the strengths and weaknesses of this scheme according to prescribed parameters.

Sustainability

The availability of subsidised credit at low interest rates is very important for farmers, especially those who have limited capital and business scale. Farmers are encouraged to establish a sustainable business, not only when they have surplus revenue from farming, but with certain money over two years from program credit. Bank Indonesia (2013)

reported that subsidised credit (KKPE) disbursed to cattle fatteners in Lamongan could expand the cattle fattening business.

However, farmers in this scheme still face difficulties with the marketing system. Farmers with less access to market information and facing delays in loan disbursement will influence the availability of inputs/output, which will impact on profit and influence the sustainability of cattle fattening. Koesmara et al. (2015) reported that limited access to the market diminishes profits for farmers.

Accessibility of credit

Even though loans are subsidised by the Government, banks still hold liability for them, so must seek credit-worthy customers. The risks involved mean that the Banks apply strict assessment and documentation criteria to applicants. Approved customers generally have: 1) a deposit (savings) history with the Bank; and/or 2) have a history of successful loan repayments; and/or 3) are a new customer with a sustainable income. This is supported by previous studies (Adams & Pischke 1992; Buttari 1995) and suggests that the policy to provide low interest rate loans leads banks to lend to larger and less riskier borrowers. Survey results in Lamongan show that financially well-off farmers have the best access to subsidised credit (Mahendri et al. 2016). Small, less financially secure farmers have little access to program credit.

Alignment with the objectives of the program

Further complications arise with the lending process that can have unintended consequences. Wealthy farmers may already have sufficient working capital to buy cattle but seek to access low interest credit for other activities such as trading or other businesses, which is not the intent of the program (to increase food security or self-sufficiency).

Risk

The other weakness of Scheme 1 is that input-output markets for cattle farmers are uncertain. They still depend on the trader's ability in determining cattle prices. This means that farmers are susceptible to the availability and market prices of feed, feeder cattle, and finished cattle. Market alignment has a large impact on profitability (Section 8.2.2) and delays in fattening periods mean income can be misaligned with loan repayments.

Loan timing

As mentioned previously, the distribution of loans in this type of scheme is sometimes not aligned with seasonal cattle cycles and markets especially if loan

application and approval processes are uncertain or extended. Most farmers, especially in Lamongan District, target peak prices at the time of the Islamic Ceremony (Eid- Adha) and buy feeder cattle 4-6 months before that. Thus, a 2-3 months delay in loan processing will mean that cattle may be more expensive, or the fattening period will be too short, which impacts significantly on profitability as shown in Table 8-4. Less profit generated by farmers with KKPE credit was also reported by Dahri et al. (2015), as those farmers faced high prices to purchase feeder cattle and lower prices when selling finished cattle.

Beneficiaries of Scheme 1 loans

There are cases where the benefits of group loans accrue to the leaders of the group. This usually happens to groups established because of program credit (Sugiarto 2011). Groups leaders have organised farmers, for example in Palang Sub District, Tuban District, to apply for a group loan of IDR500 million but it was used only by the leader to buy cattle, with other members only offered employment on the farm. Thus, the roles and the distribution of credit should be clear if farmers want to apply for loans as a group.

8.3. Scheme 2. Farmer's Group Access to Credit with Integrated Beef Cattle Company

Scheme 2 is another scheme that received program credit (old-new KUR, KKPE) from three different Banks (BRI, Bank Jatim, and Mandiri). The loan application was managed by a group and involved an agribusiness partner, the integrated beef cattle producer Wahyu Utama (see Section 7.3.4).

8.3.1. Loan Processes and Linkages for Scheme 2 Loans

Scheme 2 is based on the farmers' group "Karya Makmur Sejati" located in Plandirejo village, Plumpang Sub district, Tuban District. Initially, this group faced difficulties in applying for credit because the Bank was unfamiliar with the area, group, or their business. The group first built links with LSA, and then linked with Bank Indonesia as well as research institutions to demonstrate that the group was serious and capable in their business.

In 2008, information about program credit for cattle fattening was extended by LSA in this area. This was of interest to the group, especially given previous difficulties in applying for funds. The group leader communicated with a cattle producer in Tuban (Section 7.3.4) who had successfully applied for credit for cattle fattening from BRI. The producer agreed to provide a recommendation for the Bank if they entered into a partnership with the company. This allowed the group to successfully apply for the loan.

Types of credit

The farmers' group actively found several sources of finance to support cattle fattening. In 2010. They received KUR funding three times from Bank Mandiri Syariah in Tuban. The amounts were IDR27 million, IDR37 million, and IDR49 million with 18 farmers applying. In 2013, the group (about 12 farmers) received a new KUR credit allocation from the same Bank at an interest rate of nine percent per year. Only one person from the group could get KKPE finance due to collateral constraints. In 2016, they received program credit designed by Bank Jatim with a 15% interest rate. Each farmer, 15 in total, received a IDR50 million loan with a one-year repayment period. In December 2016, two other farmers from the group received KKP credit from BRI with a 13% interest rate and another three farmers were applying for new KUR loans at the time of interview.

The requirements for credit

In this Scheme 2, it is assumed that farmers received KUR funds, so the requirements are the same as in Table 6-7 and were prepared by the group.

Linkages and institutional arrangements

The arrangements for Scheme 2 loans can be seen in Figure 8-2.

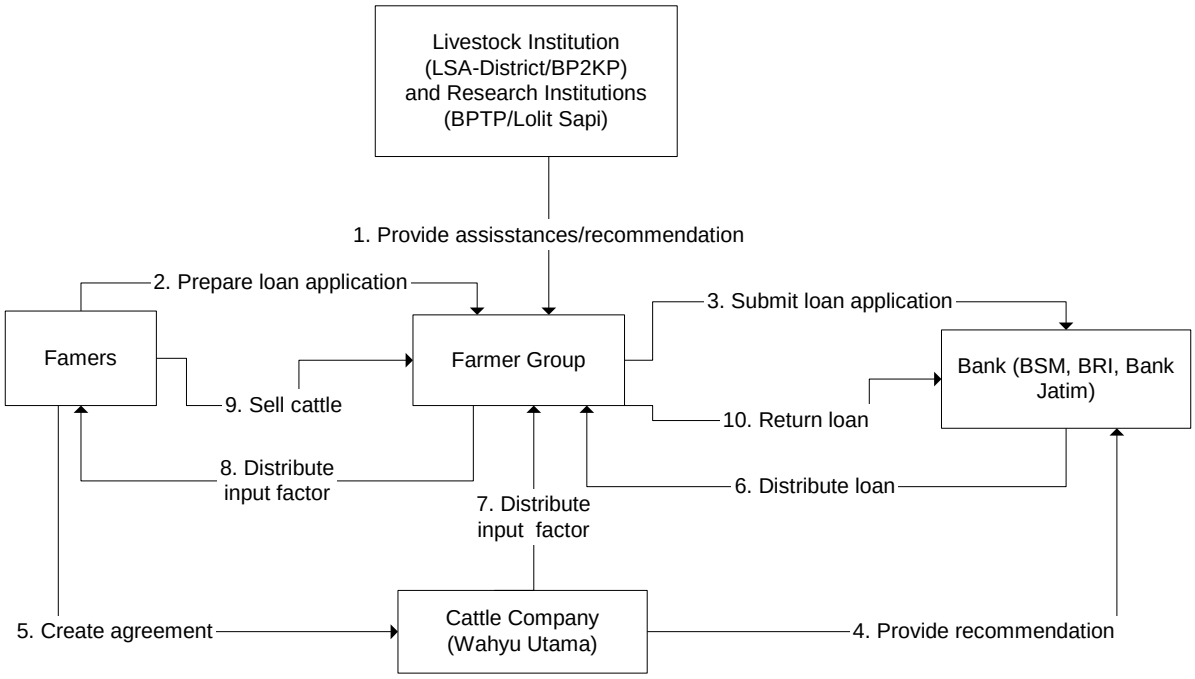


Figure 8-2. Links in the credit application procedures for Scheme 2 loans

There is no individual application to the Banks and farmers must apply as a group, but in the end, farmers manage their own businesses and generate their own profit. The

farmers' group prepares their application (Arrow 2) and makes contact with Local Government for the recommendation letterand other assistance (Arrow 1).

The application is submitted to the Bank (Arrow 3), and after assessment, the Bank allocates funds to the farmers' group (Arrow 6). The farmers' group is responsible for the distribution of funds in the form of cattle (Arrow 8) which are supplied via contract by Wahyu Utama (Arrow 5). Wahyu Utama also provided recommendations to the Bank (Arrow 4) but there is no legal agreement between cattle producer and the Bank guaranteeing the loan. As a result, farmers still need to provide collateral in the form of land title certificate.

In terms of providing cattle, the farmers need to go to a producer to choose feeder cattle and the selected cattle are transported by the producer to the farmers. The farmers' group who hold the loan from the Bank pay the cattle producer at the contracted price. The farmers' group also has to collaborate with the cattle producer to supply feed, with the group mixing complete feed to sell to members although it is not compulsory for farmers to buy concentrate or feed resources from the group.

When the farmers are ready to sell their cattle (Arrow 9), the group arranges transportation of the cattle back to the producer who pay the group and funds are then distributed to farmers, less expenses (cattle, feed, interest, and loan repayment).

8.3.2. Budget Analysis of Scheme 2 Loans

The budget analysis for this scheme is based on data from the farmers' group in Plandiredjo village. The parameters used in the analysis are in Table 8-5.

Table 8-5. Budget analysis for cattle fatteners involved in Scheme 2 loans

No	Parameters	Cashflow	Full Budget
	Number of days in fattening period (days)	180	180
	Number of cattle fattened (head)	3	3
A	**Revenue**		
1	Finished cattle sold (IDR)	66,501,000	66,501,000
2	Manure (IDR)	-	-
3	Biogas (IDR)	-	175,000
	Total revenue	66,501,000	66,676,000
B	**Non-Capital Costs**		
1	Feeder cattle (IDR)	44,685,000	44,685,000
2	Labour (IDR)	-	9,000,000
3	Veterinary services (IDR)	144,000	144,000
4	Feed (IDR)	4,762,800	5,608,961
5	Manure (IDR)	-	-
6	Depreciation of biogas installation (IDR)	-	1,250,000
7	Depreciation of pen (IDR)	-	301,636
8	Other costs (IDR)	170,000	170,000
a	Communication (IDR)	20,000	20,000
b	Transport (IDR)	150,000	150,000
9	Weight loss (IDR)	2,700,000	2,700,000
a	Purchase loss (IDR)	1,350,000	1,350,000
b	Sale loss (IDR)	1,350,000	1,350,000
	Total Non-Capital Costs	52,461,800	63,859,596
D	**Gross profit per fattening period**	14,039,200	2,816,404
	Gross profit per head per day	25,998	5,215
	Gross profit per day	77,995	15,646
D	**Capital Costs**		
1	Interest per period (IDR)	2,205,000	2,205,000
2	Application cost (IDR)	1,000,000	1,000,000
3	Opportunity cost of own capital (IDR)	-	319,170
	Total Capital Costs	3,205,000	3,524,170
E	**Net profit per fattening period**	10,834,200	-1,745,741
	Net profit per head per day	20,063	-3,233
	Net profit per day	60,190	-9,699

Feeder and finished cattle prices

The number of cattle kept by farmers varies, with an average of three head. The initial weight gain is about 331 kg. At the time of interview, farmers bought feeder cattle from Wahyu Utama at a contract price of IDR45,000 per kg and sold the cattle back at the same price. The average final weight gain for cattle in this scheme is about 493 kg. Interestingly, farmers usually treat their own cattle differently to those funded by credit. They keep their own cattle for three to four months, because they do not want to spend

more on feed to fatten them because it is expensive, and they can buy and sell through the local market whenever they want.

Marketing costs

The marketing system in this case is coordinated by the farmers' group. The cost to transport cattle from producer to the farmer's home is assumed about IDR50,000/head, and there is no cost at sale as this is covered by the producer. Communication cost is assumed similar to Scheme 1 which is about IDR20,000.

There is cattle depreciation during transporting cattle (when buying and selling cattle) which was up to 20 kg per head per cycles or accounted for 40 kg/year and the cost for this is covered by farmer. There is one case by one farmer that makes a contract with an input supplier for one year, so he needs to compensate only 20 kg of depreciation for a year.

Manure price

Unlike the Scheme 1 example, the group in this case use manure for biogas. Based on the interview with them, 9720 kg of manure can replace the gas cylinders used by farmers to cook (about 3 gas cylinders per month) for 6 months, with the price of gas cylinders about IDR17,500 per kg. It is estimated that the price of manure processed into biogas is about IDR32.4 per kg.

This farmers' group received the biogas installation free from the government, but in the full budget, the cost is estimated by depreciating the cost of the installation. The cost for building a biogas installation is about IDR25 million and the life is assumed to be about 10 years.

Labour costs

Farmers in this scheme use one family member to look after the cattle with the cost assumed about IDR25,000 per day.

Veterinary costs

Generally, farmers give their cattle vitamins at the beginning of the fattening period and anthelmintic every month. The price of vitamins and anthelmintic is about IDR12,000 and IDR6,000, respectively. It is assumed that farmers contact the veterinary staff once each fattening period with the cost about IDR50,000. In total, veterinary costs are estimated at about IDR267 per head per day.

Feed costs

Farmers buy complete feed from farmers' groups who make their feed with assistance from a research institution and LSA (Table 8-6). Most farmers usually choose the second type of feed and they pay for it after selling cattle. On average, the ADG of cattle on this feed is about 0.8-1.0 kg per day.

Table 8-6. The feed formula made and sold by farmers' group

No	Type of feed resources	Formula 01 (PK 20%)	Formula 02 (PK 18%)	Formula 03 (PK 13%)
1.	Soybean kernel	8	8	0
2.	Palm-oil kernel	20	20	18
3.	Maize skin		10	10
4.	Peanut skin	10	10	10
5.	Pollard	5		
6.	Sugar cane tops	15	15	15
7.	Coffee skins	15	15	15
8.	Rice bran	5		10
9.	Soybean sludge	20	10	10
10.	Corn husk		10	10
11.	Salt	1	1	1
12.	Urea	1.5	1	1
	Price per kg	1475	1260	1110

Source: Report from farmer group

Farmers also feed natural grass or rice straw depending on its availability (Table 8-7). If they feed their cattle with natural grass, the amount of concentrate fed to cattle decreases to 6-8 kg/day/head, while without natural grass, they will feed the cattle with 10 kg/day/head. The price of native grass is assumed as that mentioned in the budget analysis for a representative household in Section 5.4. Also, farmers paid two labourers about IDR100,000 plus expenses for fuel (IDR10,000) to harvest 700 kg of rice straw from their land, with the price of rice straw assumed at about IDR157.14 per kg.

Table 8-7. The feed and its cost in Scheme 2 loans

No	Parameters	Cashflow	Full Budget
1	Feed cost (IDR/head/period)	1,587,600	1,869,654
a	Total native grass (IDR per head/period)	-	140,625
	Amount of native grass per day (kg/head)	15	15
	Price of native grass (IDR/kg)	-	104
	Number of days	90	90
b	Total rice straw (IDR per head/period)	-	141,429
	Amount of rice straw per day (kg/head)	10	10
	Price of rice straw (IDR/kg)	-	157
	Number of days	90	90
c	Total complete feed (IDR per head/period)	1,587,600	1,587,600
	Amount of complete feed per day (kg/head)	7	7
	Price of complete feed (IDR/kg)	1,260	1,260
	Number of days	180	180

Pen costs

The average of cost of pens in Scheme 2 was about IDR5.4 million and they can be used for about 9 years. The depreciation of a pen per fattening period (6 months) is estimated about IDR301,600.

Credit costs

While this farmers' group received many types of credit from the Banks, in this analysis, it is assumed that they use new KUR credit, because the majority of farmers in this group received that type of credit. The interest rate is about 9% per year. In addition, each farmer paid for processing the loan application which was about IDR1 million for the group. The rest of the money is kept by the group as a deposit and settled after harvesting.

Profitability

The gross profit received by farmers is higher than that in Scheme 1 which is about IDR77,996 (cashflow) and IDR15,647 per day (full budget). While the cash surplus earned by farmers is positive (IDR60,190 in cashflow budget), this figure is negative (-IDR9,699) when all costs are included in the full budget analysis. However, farmers perceive that their income from this business is high, and more than the income earned as farm labour (IDR50,000).

The high profit received by farmers in this scheme is affected by some factors. Training and assistance received appears to have paid off with a high ADG of 0.8-1.0 kg per day. The contracted price with the cattle company also produced a positive outcome and confirms Dahri et al. (2015) findings. Moreover, the strong group built under this

scheme can share production costs. For example, the group buys the feed resources on a large scale and produces complete feed, so they can reduce the feed cost which is represented in the budget (Section 5.4.1) at about IDR9,782-14,398 per head/day to IDR8,820 (cashflow) and IDR10,387 (full budget) per head/day. Even with a high interest rate, the cost of capital is compensated by a lower production cost for cattle and feed which are a large component of cost in the budget analysis.

However, there is a cost when cattle lose weight due to the stress of transport and this has to be covered by farmers in this scheme. This might reduce the profit they receive. To deal with this problem, the cattle producer suggests farmers stable the cattle for one night at the producer's place before weighing the cattle. Based on farmers' experience, the decline in weight when cattle are delivered to the producer is about 10 kg/head, but after stabling the cattle overnight, the weight gain of cattle just increases about 2 kg, so it reduces the profit of farmers. Therefore, if this cost can be shared between farmers and the company, the decrease in income might be reduced.

8.3.3. An Assessment of Scheme 2 Loans

This section provides an in-depth analysis for Scheme 2 loans and is assessed on the parameters below.

Sustainability

In this scheme, even when subsidised credit from the Government stopped, Banks could still can provide farmers with funds. This might be because the farmers' group is active and has a good reputation with the Banks, which ensures the sustainability of the business. Moreover, the connection with the cattle company ensures the availability of inputs and a market for the output. This can help profitability and support the sustainability of the business. In addition, the experience of the farmers' group in this scheme may help individual farmers, especially those lacking access to the market or knowledge. This could achieve higher profits and reduce their risk of failure.

Accessibility of credit

In terms of accessibility, a farmers' group accessing a credit scheme may ease the farmers access to program credit or capital from Banks. By joining a group, the farmers had access to information and expertise to help manage their finance. In addition, a farmers' group with a good credit history is likely to have easier access to Bank funds in the future (Sugiarto 2011). It also reduces the risk and transaction costs for the Bank.

Alignment with the objectives of the program

As the farmers' group is collectively responsible for the loan, formal records are kept of individual expenses and the group meets regularly to monitor business activity. The collective nature of the agreement provides less opportunity for farmers to deny their obligations. At the same time, it reduces the opportunity for the use of funds for things other than cattle business thereby supporting the food security program in Indonesia.

Risk

The cattle company acts as a partner in purchasing and selling cattle which strengthens the continuity of the cattle fattening sector. This then assures the profit from the business and will impact on the repayment of loans (Mayangsari et al. 2014). Finally, it reduces the risk for Banks providing credit to farmers.

Loan timing

The availability of feeder cattle from the producer who has a contract with the farmers is limited especially for those with average body weight less than 400 kg, which fit with the amount of loan funds received. This situation forces farmers to wait up to 15 days, and as a result there will be a delay in the fattening period. However, with the arrangements with the group, they can share the loan between farmers, so if one gets larger cattle, it can be supported with loan funds from another member.

Beneficiaries of Scheme 2 loans

The availability of a group managed loan has benefits to those who receive the loan as well as other members in the group, such as the case where a farmer received a loan to purchase three cattle but did not want to keep all of them, so the group can share the cattle among other farmers. Similar to the loans distributed under Scheme 1, which encourages the development of a feed market, members and other farmers in the area will benefit.

8.4. Scheme 3. Farmers' Group Access to Rural Bank without Agribusiness Links

In this section Scheme 3 is reviewed, with a group of farmers wishing to access PMI credit established only for those in the Lamongan District (Section 6.3.2). The Rural Bank (BPR Lamongan) is responsible for the disbursement of credit in this scheme.

8.4.1. Loan Processes and Linkages with Scheme 3 Loans

The description will be only of the process of credit distribution and loan repayment. The criteria for this credit scheme have been discussed previously in Table 6-7, Section 6.4.1.

Linkages and institutional arrangements

There are two processes that will be described here which are the arrangement of budget by LSA and the farmer's application process. The first part involves LSA-Lamongan District, BPR Lamongan Bank, and the Local Government of Lamongan District (Figure 8-3).

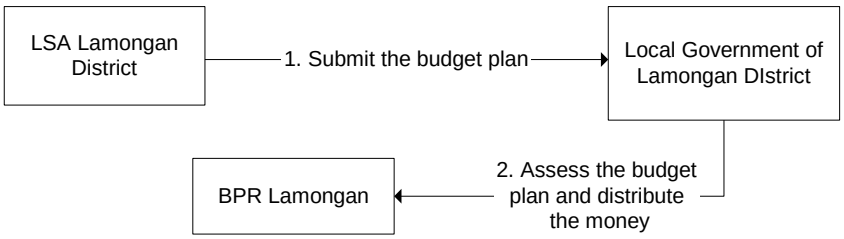


Figure 8-3. The arrangement of a budget for PMI credit

The arrangement of credit is conducted regularly each year as long as the Local Government of Lamongan supports the credit program. LSA-Lamongan District prepares the budget plan for PMI at the end of the year for the coming year and submits it to the Local Government of Lamongan District. For example, the budget for PMI in 2016, was processed by LSA processed at the end of year 2015. After assessment, the Local Government of Lamongan determined how many funds could be distributed for PMI, and this funding was transferred to BPR Lamongan.

However, the amount of funding that was distributed as PMI credit was not the same as the budget plan submitted by LSA. For example, in 2016, they applied for about IDR 4-5 billion, but only disbursed IDR2.2 billion for livestock. Based on data from LSA, this amount has been constant since the program was established in 2008.

Before the disbursement of funds (which is usually in February each year), LSA together with the Bank start the process of farmer selection (Figure 8-4). These institutions also assist farmers' groups to prepare proposals and loan applications. The farmers' group then submits their proposal to the LSA (Arrow 1) which usually happens around January-February each year.

The applications are assessed, followed by visits to the farmer's' business. After the Bank decides which applications to approve, funds are distributed into farmer's Bank

accounts (Arrow 2) and the money is usually disbursed in February. Finally, farmers return the money directly to the Bank (Arrow 3).

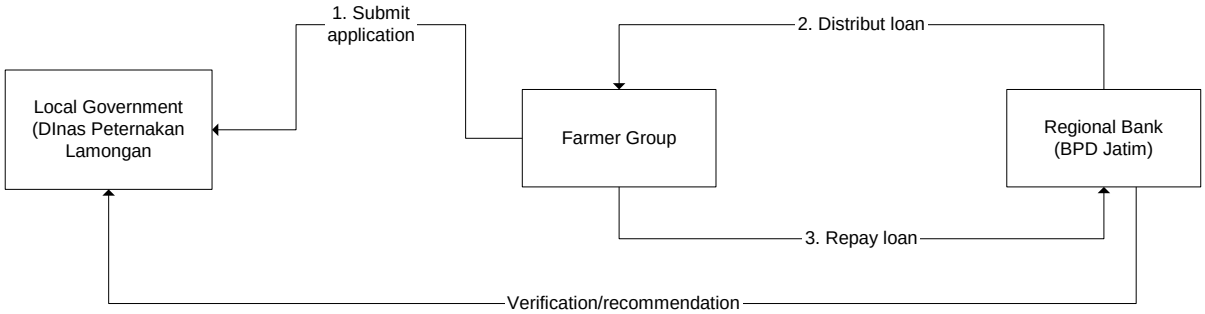


Figure 8-4. The process of supplying credit in Scheme 3 loans

Repayment processes

The repayment of PMI credit occurs twice a year in September, to pay the interest (at the rate of 6% per year) and December when the loan is repaid. Due to delays in distribution, farmers pay the interest for one year, not for the 10 months they hold the funds. After farmers return their loans, the Bank pays back the money to LSA with two percent interest as revenue for the local government. The other four percent received by the Bank will be distributed with 1% going to the farmers' group and 4% to the Bank to cover operational costs. The Bank is usually responsible for monitoring repayment, however, the LSA will help the Bank where farmers cannot return the funds although during 2008, there were no issues with credit repayment.

8.4.2. Budget Analysis of Scheme 3 Loans

The budget analysis of cattle fattening with Scheme 3 credit is presented in Table 8-8.

Table 8-8. Budget analysis for fatteners involved in Scheme 3 loans

No	Parameters	Cashflow	Full Budget
	Number of days in fattening period (days)	270	270
	Number of cattle fattened (head)	4	4
A	**Revenue**		
1	Finished cattle sold (IDR)	81,141,280	81,141,280
2	Manure (IDR)	-	864,000
3	Biogas (IDR)	-	-
	Total revenue (IDR)	81,141,280	82,005,280
B	**Non-Capital Costs**		
1	Feeder cattle (IDR)	62,505,600	62,505,600
2	Labour(IDR)	-	6,750,000
3	Veterinary services (IDR)	528,800	528,800
4	Feed (IDR)	10,148,760	12,650,760
5	Manure (IDR)	-	120,000
6	Depreciation of biogas installation (IDR)	-	-
7	Depreciation of pen (IDR)	-	1,630,625
8	Other cost (IDR)	420,000	420,000
a	Communication (IDR)	20,000	20,000
b	Transport (IDR)	400,000	400,000
9	Weight loss (IDR)	-	-
a	Purchase loss (IDR)	-	-
b	Sale loss (IDR)	-	-
	Total Non-Capital Costs (IDR)	73,603,160	84,605,785
C	**Gross profit per fattening period**	7,538,120	-2,600,505
	Gross profit per head per day	6,980	-2,408
	Gross profit per day	27,919	-9,632
D	**Capital Costs**		
1	Interest per period (IDR)	600,000	600,000
2	Application cost (IDR)	100,000	100,000
3	Opportunity cost of own capital (IDR)	-	2,697,063
	Total Capital Costs (IDR)	700,000	3,397,063
E	**Net profit per fattening period**	6,838,120	-5,997,568
	Net profit per head per day	6,332	-5,553
	Net profit per day	25,326	-22,213

Feeder and finished cattle prices

The number of cattle kept by farmers on average is about 4 head with a nine-month fattening period. Based on the survey, the price of cattle is about IDR15.6 million per head (IDR51,000 per kg) with the initial body weight assumed about 306 kg, while the average price of finished cattle is about IDR20.3 million per head (IDR44,000 per kg) with the body weight about 461 kg.

Marketing costs

The farmer usually buys and sells the cattle individually not through a group or with other farmers. The transport cost is assumed about IDR50,000 per head from market to the pen, and when farmers sell the cattle back in the market. Communication cost is assumed about IDR20,000.

Manure prices

This parameter is assumed the same as in budget analysis for representative households (Section 5.4.1).

Labour costs

Most of farmers use only family labour to keep cattle with the cost assumed to be about IDR25,000.

Veterinary costs

Total veterinary costs are estimated about IDR490 per head per day as assumed in the representative farm budget (Section 5.4.1).

Feed costs

The farmers who are involved in this scheme still use traditional feeding systems depending on native grass, rice straw, and soybean straw availability. Farmers also sometimes use elephant grass collected from their land. As with other traditional cattle fattening in the research area, farmers in this scheme mix the drinking water with rice bran, salt, and molasses (Table 8-9).

Table 8-9. Feed costs in Scheme 3 loans

No	Parameters	Cashflow	Full Budget
1	Total feed cost (IDR/head/period)	2,537,190	3,162,690
a	Total native grass (IDR per head/period)	-	378,000
	Amount of native grass per day (kg/head)	14	14
	Price of native grass (IDR/kg)	-	200
	Number of days	135	135
b	Total elephant grass (IDR per head/period)	-	112,500
	Amount of elephant grass per day (kg/head)	6	6
	Price of elephant grass (IDR/kg)	-	625
	Number of days	30	30
c	Total soybean straw (IDR per head/period)	-	157,500
	Amount of soybean straw per day (kg/head)	7.5	7.5
	Price of soybean straw (IDR/kg)	-	700
	Number of days	30	30
d	Total rice straw (IDR per head/period)	-	135,000
	Amount of rice straw per day (kg/head)	10	10
	Price of rice straw (IDR/kg)	-	100
	Number of days	135	135
e	Total rice bran (IDR per head/period)	2,199,015	2,199,015
	Amount of rice bran per day (kg/head)	3.5	3.5
	Price of rice bran (IDR/kg)	2,327	2,327
	Number of days	270	270
f	Total salt (IDR per head/period)	64,800	64,800
	Amount of salt per day (kg/head)	0.30	0.3
	Price of salt (IDR/kg)	800	800
	Number of days	270	270
g	Total molasses (IDR per head/period)	273,375	273,375
	Amount of molasses per day (lt/head)	0.15	0.15
	Price of molasses (IDR/liter)	6,750	6,750
	Number of days	270	270

Pen costs

The average cost of pens for farmers in Scheme 3 was about IDR26 million and they can be used for about 12 years. The depreciation of pens per fattening period (9 months) is estimated about IDR1.6 million.

Credit costs

The interest rate on credit is about six percent per year, however, even though the fattening period is nine months, the farmers still pay the full six percent interest rate for one year. Total credit received by farmers is about IDR10 million per farmer or IDR100 million for the group. Another cost of credit is administration which costs about IDR100,000.

Profitability

Gross and net profit generated by farmers per day in this scheme is about IDR27,919 and IDR25,326 (in cashflow), while the full budget shows those figures are negative (not profitable) at -IDR9,632 and -IDR22,213. This return is less than the cash received from working as a farm labourer (IDR50,000 per day).

There are several factors that make this scheme less profitable. There is less money available to borrow which leads farmers to choose smaller cattle and keep them longer. Consequently, the costs to keep the cattle increase which reduces profit. The ADG is also low (0.57 kg/day) and the disbursement of funds does not align with seasonal market fluctuations. There also may be delays starting the fattening period yet farmers must still pay the full year's interest, so the profit earned is affected, if not significantly (by about 2-3%). The subsidised interest rate does allow this scheme to generate some surplus for the farmers as in cashflow analysis. If there was no subsidy from government, farmers would have to pay the full the interest rate (13-15%), and this would reduce the cash surplus by about 10-13% and profit by 12-15% (full budget), (Table 8-10).

Table 8-10. The net profit without subsidised interest, and delay in loan timing

No	Parameters	Net Profit (IDR/day)	
		Cashflow	Full Budget
	Subsidised vs non-subsidised		
1	Subsidised credit	25,326	-22,213
a	Commercial interest rate 13%	22,734 (-10)	-24,806 (-12)
b	Commercial interest rate 15%	21,993 (-13)	-25,547 (-15)
2	Delay on loan funding, indicated by		
a	Increase 10% in feeder cattle price	2,176 (-91)	-46,101 (-108)
b	Decrease 10% in finished cattle price	-4,726 (-119)	-52,266 (-135)
3	All changes (1b, 2a, 2b)	-30,469 (-220)	-78,746 (-255)
4	Loan timing aligned with fattening period	25,882 (2)	-21,658 (-3)

Note: Figures in ( ) are percentages

8.4.3. An Assessment of Scheme 3 Loans

This section provides in-depth analysis of credit Scheme 3 based on several parameters.

Sustainability

In Scheme 3, the amount of the loan is limited depending on the budget of the Local Government (Lamongan District). When there is a high demand for loans, the stability of the fattening operation may be threatened. This is exacerbated by the lack of links to agribusiness which delays the marketing of cattle and the income generated by farmers is

affected. Moreover, the accessibility of credit that affects the sustainability of the fattening business is dependent on Local Government policy decisions to continue providing credit for farmers (Sugiarto 2011).

Accessibility of credit

Since 2008, the low interest loans available for livestock has remained constant (IDR2.2 billion per year), while the number of farmers who apply for this credit has increased every year. Among those who are successful in accessing these loans are many repeat applicants, also reported by (Sugiarto 2011). The Bank already has a record of these borrowers (documents, character, etc.), which reduces the Bank's transaction costs.

Alignment with the objectives of the program

The limited funds in this scheme, that do not cover the cost of purchasing cattle, results in the possibility that the funds may be used for other business. This is exacerbated by poor monitoring from LSA and the Bank and will likely impact on the effectiveness of this program to support the development of cattle production. Based on the survey, most of the farmers who obtained this form of credit are cattle traders who were seeking low interest loans for their business.

Risk

The poor linkage with agribusiness removes certainty around input-output markets placing greater risks on Banks (Suardika et al. 2015). To reduce this risk, Banks seek collateral in the form of a land or vehicle certificate from farmers even though providing collateral is not required in the criteria for this credit as determined by the Government.

Loan timing

This credit usually is disbursed in February and farmers have to return the loan in December, while in the middle of the year (September), farmers have to pay all of the interest. Based on information from traders, the price of feeder cattle is usually expensive in February, while this price will go down in May-July due to many sales with farmers selling cattle to pay school fees. As a result, most farmers will delay their business until such time when the price of cattle is down and reduce their fattening period. Dahri et al. (2015) reported that poor timing between disbursement of loans and cattle marketing resulted in less income for farmers who obtained KKPE credit.

Beneficiaries of Scheme 3 loans

The high demand from farmers to access credit results in the tied selection of borrowers by the Banks. They tend to include the same farmers who already have experience with this form of credit (Sugiarto 2011), even though these farmers may use the credit for business other than cattle fattening. As a result, there is less chance of other farmers, who may have more ability to increase cattle fattening and need the capital for this business, obtaining funds. Group loan applications may also lead to the use of the funds by one person (the leader), which is exacerbated by the fact that the amount available per person is not enough to buy one animal, so farmers just leave the loan with the leader.

8.5. Scheme 4. Farmers' Group Access to Credit through Cooperatives

As mentioned in Chapter 7 (Section 7.5), company in Tuban District is also involved in funding cattle fattening and strengthening the farmers' groups in the area through establishing a Cooperative in Palang Sub District. In this section, how the scheme credit from the company works in the Cooperative works will be discussed. There are three cases linked to farmers' groups (in Leran Kulon, Glodog, and Gesing Villages) wherethis scheme operates for cattle fattening.

8.5.1. Loan Processes and Linkages of Scheme 4 Loans

There are two types of loan available from the company's CSR fund. One is a grant called the "stimulant fund" for farmers' groups which distribute funds directly to the group and CSR funds distributed through the cooperative. The second is given to farmers if they are successful in cattle fattening with the first grants.

Stimulant fund

The Stimulant fund was distributed to farmers' groups before the establishment of the Cooperative. There is about IDR47 million managed by the farmers' group, but it may be managed differently in each village.

In general, the process of applying for this credit is simple (Figure 8-5). Farmers in a group prepare the proposal, including the budget for fattening cattle (Arrow 1). The proposal is submitted to the company (Arrow 2), which takes about 2 months to process, approve, and release funds (Arrow 3). These funds from the company belong to the farmers' group and members who use the money pay it back to the group (Arrows 4 and 5).

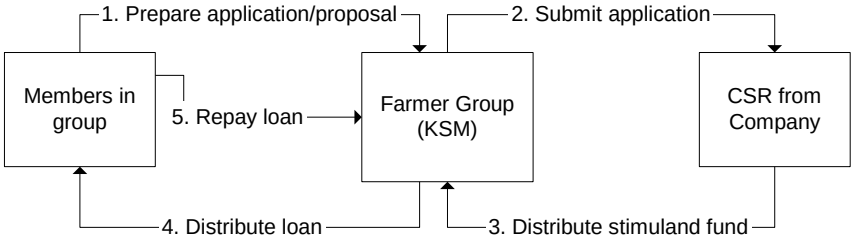


Figure 8-5. The process of applying for stimulant funds from company in Scheme 4

i. Case study group Gemah Ripah in Glodok Village, Palang Sub District

The farmers' group in Glodog Village with 35 members used the stimulant fund (about IDR47 million) to renovate pens (about IDR17 million) and to buy two head of cattle. Those cattle were kept by one farmer from the group who was paid about IDR12,000 per day. The group bought the cattle from the local market (Tuban and Bojonegoro) and sold the cattle to village traders after feeding them with concentrate at a price of about IDR2,200 per kg. The ADG of cattle was 1.4-1.5 kg/day, more than the expected ADG (1.0 kg/day). The profit from this fattening business is used to pay labour and purchase cattle for the next period. During two fattening periods, this group generated IDR12 million, and this profit is kept as savings by the farmers' group.

ii. Case study group Lohjinawi in Gesing Village, Semanding Sub District

This farmers' group with 20 members in Gesing village used the stimulant fund and additional money from members to buy three head of cattle and build a pen on land owned by a member of the group. This farmer will eventually buy the pen, and the farmers' group will rent it from him (IDR100,000 per month excluding water, electricity etc.).

Cattle are bought from the local market in Bojonegoro and sold to a butchering company (Eka Putra Jaya in Bojonegoro) with no formal contract. This butcher accepts the cattle on weight with the price depending on the grade of cattle (Grade A IDR45,000; Grade B IDR44,000; and Grade C IDR43,000 per kg). The cattle grades are defined by the company and farmers are unaware of the indicators for each grade.

Members take turns to keep the cattle (2 persons per day) and are paid about IDR2,500 per head for pen cleaning and feeding of cattle. The cattle are fed with concentrate from suppliers at IDR2,200 per kg and result in finished cattle with ADG of 0.8 kg/day, however the quality of feed is inconsistent.

The profit is used to buy more cattle (four head) and covers feed costs for the second fattening period. The profit is allocated, about 20% as deposit to the group (that will be invested together with the loan from the cooperative) and the remaining 80% is shared

between members. However, as some farmers have also invested their own money in this business, they will receive 80% of profit and the remaining non-investors receive 20%.

iii. Case study group Sumber Makmur in Leran Kulon Village, Palang Sub District

This farmers' group with 31 members used money to renovate pens and buy two head of cattle. Cattle were managed by the leader who hired two labourers from among the members at a cost of IDR35,000 per person/day. Consequently, the production costs were expensive. The group also purchased cattle from the local market at a high price, IDR56,000 per kg and sold to the butcher at a lower price about IDR38,000 per kg. This resulted in a loss from cattle fattening, and the money spent purchasing cattle (IDR30 million) decreased to IDR25 million, which was then used to build pens (IDR70 million) with additional money from the leader. The outlay by this group increased when they received the loan from the cooperative because they had to pay back the investment by the leader.

This group fed their cattle with concentrate estimated at IDR2500 per kg. The resultant loss may be due to lack of experience in cattle marketing and loan repayment obligations for the pen.

Loans from the private company through cooperative (Scheme 4)

i. Loan requirements

When applying for a loan, all members are required to sign the application even if the loan application from the group will benefit an individual. Essentially, the farmers' group acts as a guarantor and should a member default, the remaining members will be unable to apply for loans in the future.

The group must also provide administrative requirements such as, identity cards, family certificates, and an approval letter from the village leader. They are also required to attach a business plan, including the production plan, projected cashflow, profile of the farmers' group with the responsibilities of each member, profit sharing arrangements, and evidence of a standard pen with a concrete feed trough.

ii. Linkage and institutional arrangements

The detailed flow of funds to three farmers' groups through cooperatives is shown in Figure 8-6. However, the way of farmers' groups managed the loan was different: individually (in Glodok village), or as a group (in Leran Kulon and Gesing villages).

Farmers apply for credit as a group with assistance from BSM (Section 7.5.1). In fulfilling the requirements (Arrow 1), the application is then submitted to the cooperative

(Arrow 2). The cooperative checks the documentation before submitting it to BSM in Bojonegoro. If the application is complete, it is sent to BSM in Jakarta (Arrow 3). The assessment of the application includes a review of the business plan, group recommendations, feasibility of the business, the likely return and applicants' expenditure, character of farmers, and a field visit (Arrow 4). If BSM in Jakarta approves, credit is sent to the cooperative (Arrow 5), and the cooperative will contact Wahyu Utama (Section 7.3.4) to provide cattle (Arrow 6). Farmers choose the cattle from the producer and the cooperative pays for the purchase (Arrow 8). The cooperative will also supply cattle feed (Arrow 7) and cost will be calculated at the end of period (4-6 months according to the contract). Farmers will commence the contract on delivery of the cattle but if no cattle are received the cooperative retains the funds.

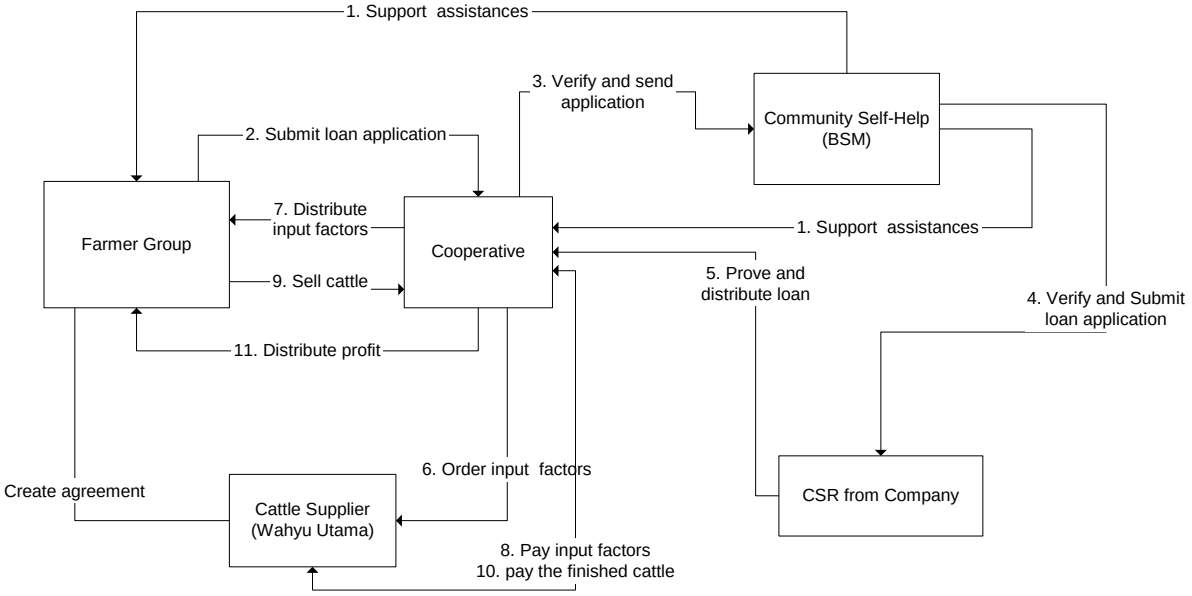


Figure 8-6. The process of applying for credit in Scheme 4 loans

Repayment of these loans is based on the system defined by the cooperative with their members. After finishing, farmers contact the cooperative to sell the cattle back to the producer (Arrow 9), who pays the cooperative (Arrow 10). The cooperative deducts all expenses (interest, feed cost, etc.) and returns the remaining profit to the farmers. The farmers' group can then apply for credit again from the cooperative, as these funds remain with cooperative and are not returned to the company.

8.5.2. Budget Analysis of Scheme 4 Loans

Several parameters were used in the budget analysis of cattle fattening under this scheme (Table 8-11).

Table 8-11. Budget analysis for cattle fatteners involved in Scheme 4 loans

		Glodok		Leran Kulon		Gesing	
No	Parameters	Cashflow	Full Budget	Cashflow	Full Budget	Cashflow	Full Budget
	Number of days in fattening period (days)	120	120	120	120	180	180
	Number of cattle fattened (head)	18	18	18	18	9	9
A	**Revenue**						
1	Finished cattle sold (IDR)	411,470,000	411,470,000	356,868,000	356,868,000	248,814,000	248,814,000
2	Manure (IDR)	-	-	-	-	-	-
3	Biogas (IDR)	-	630,000	-	630,000	-	472,500
	Total revenue	411,470,000	412,100,000	356,868,000	357,498,000	248,814,000	249,286,500
B	**Non-Capital Costs**						
1	Feeder cattle (IDR)	294,627,240	294,627,240	267,444,000	267,444,000	189,198,000	189,198,000
2	Labour (IDR)	-	9,000,000	12,000,000	12,000,000	8,100,000	8,100,000
3	Veterinary services (IDR)	342,000	342,000	1,944,000	1,944,000	216,000	216,000
4	Feed (IDR)	33,264,000	35,460,396	44,125,690	44,125,690	24,948,000	26,595,297
5	Manure (IDR)	-	-	-	-	-	-
6	Depreciation of biogas installation (IDR)	-	350,000	-	350,000	-	525,000
7	Depreciation of pen (IDR)	-	363,110	500,000	2,833,333	600,000	600,000
8	Other cost (IDR)	900,000	920,000	900,000	920,000	450,000	470,000
a	Communication (IDR)	-	20,000	-	20,000	-	20,000
b	Transport (IDR)	900,000	900,000	900,000	900,000	450,000	450,000
9	Weight loss (IDR)	12,420,000	12,420,000	12,420,000	12,420,000	6,210,000	6,210,000
a	Purchase loss (IDR)	6,210,000	6,210,000	6,210,000	6,210,000	3,105,000	3,105,000
b	Sale loss (IDR)	6,210,000	6,210,000	6,210,000	6,210,000	3,105,000	3,105,000
	Total non-capital costs	341,553,240	353,482,746	339,333,690	342,037,023	229,722,000	231,914,297
C	**Capital Costs**						
1	Interest per period (IDR)	9,600,000	9,600,000	9,600,000	9,600,000	10,800,000	10,800,000
2	Application cost (IDR)	2,400,000	2,400,000	2,400,000	2,400,000	1,800,000	1,800,000

3	Opportunity cost of own capital (IDR)	-	5,008,144	-	4,845,981	-	4,928,643
	Total capital costs	12,000,000	17,008,144	12,000,000	16,845,981	12,600,000	17,528,643
	Per Group						
D	**Gross profit per fattening period**	69,916,760	58,617,254	17,534,310	15,460,977	19,092,000	17,372,203
	Gross profit per head per day	32,369	27,138	8,118	7,158	11,785	10,724
	Gross profit per day	582,640	488,477	146,119	128,841	106,067	96,512
E	**Net profit per fattening period**	57,916,760	41,609,110	5,534,310	-1,385,003	6,492,000	-156,440
	Net profit per head per day	26,813	19,263	2,562	-641	4,007	-97
	Net profit per day	482,640	346,743	46,119	-11,542	36,067	-869
	For those who invested money (5 farmers)						***)***
D	**Gross profit per fattening period**	23,305,587	19,539,085	762,361	672,216	3,054,720	2,779,552
	Gross profit per head per day	10,790	9,046	353	311	1,886	1,716
	Gross profit per day	194,213	162,826	6,353	5,602	16,971	15,442
E	**Net profit per fattening period**	19,305,587	13,869,703	240,622	(60,218)	1,038,720	(25,030)
	Net profit per head per day	8,938	6,421	111	(28)	641	(15)
	Net profit per day	160,880	115,581	2,005.18	(501.81)	5,771	(139)
	For who did not invest money per farmer (15 farmers)						
D	**Gross profit per fattening period**					254,560	231,629
	Gross profit per head per day					157	143
	Gross profit per day					1,414	1,287
E	**Net profit per fattening period**					86,560	-2,086
	Net profit per head per day					53	-1
	Net profit per day					481	-12

Feeder and finished cattle prices

The price of cattle is defined by the cattle producer based on the market price at the time of the contract and was about IDR46,000 per kg. There were 9 head of cattle fattened in the Gesing area and 18 head of cattle in the other two areas. The loan received by the farmers' group in Gesing was smaller than the others. Farmers kept the cattle for 4-6 months with ADG of about 0.8-1.18 kg per day. Details for each area are presented in Table 8-12.

Table 8-12. The cost and revenue of feeder and finished cattle in Scheme 4 loans

No	Parameter	Glodok	Leran Kulon	Gesing
1	Feeder cattle cost (IDR)	294,627,240	267,444,000	189,198,000
a	Number of cattle fattened (head)	18	18	9
b	Price of feeder cattle (IDR/kg)	46,000	46,000	46,000
c	Initial weight (kg)	356	323	457
2	Finished cattle sold (IDR)	411,872,040	356,868,000	248,814,000
a	Price of cattle sold (IDR/kg)	46,000	46,000	46,000
b	Final weight (kg)	497	431	601
c	ADG (kg/day)	1.2	0.9	0.8
3	Number of days in fattening period (days)	120	120	180

Marketing costs

The transportation costs on the sale of cattle is paid by farmers at IDR50,000 per head with the Cooperative hiring a truck with capacity of 8-10 cattle at IDR450,000. Communication costs are estimated at IDR20,000, but as this cost is managed by the cooperative it shows only in the full budget. As cattle are weighed at the producer's place, there is a weight loss during transport which is about 12-17 kg per head when buying and selling that is borne by the farmer.

Manure price

Revenue from manure is estimated from total manure produced (21,600 kg) and the gas produced can replace nine gas cylinders per month for four months (IDR17,500 per kg gas cylinders), with the price of manure estimated at IDR29.17 per kg. The cost of building the biogas installation is about IDR10 million and the life is assumed to be around 10 years, so the depreciation of the biogas installation is estimated at IDR350,000 per fattening period.

Labour costs

In Glodok, cattle are managed by three farmers with the use of family labour. Wages are estimated using the wage paid to farmer labourers (see Section 5.4.1.) about IDR25,000 per half day.

In contrast, farmers' groups in Leran Kulon managed their cattle in a communal pen and hired two labourers with a wage of IDR50,000 per day, including overnight, as the location of the pen is far from any farmer's house. The same applies for the farmers' group in Gesing who also hired two labourers from within the group who are paid about IDR2500 per head, per day.

Veterinary costs

In general, farmers give their cattle vitamins and anthelmintic (Table 8-13).

Table 8-13. Total veterinary cost for cattle

No	Parameters	Glodog	Leran Kulon	Gesing
1	Veterinary costs (IDR/head/period)	19,000	108,000	24,000
a	Total cost for vitamins (IDR)	12,000	80,000	12,000
	Price of vitamins (IDR)	12,000	12,000	12,000
	Times given per fattening period	1	2	1
b	Total cost for anthelmintic (IDR)	7,000	28,000	12,000
	Price of anthelmintic (IDR)	7,000	7,000	6,000
	Time given per fattening period	1	4	2

Feed costs

The farmers involved in this scheme use feed concentrate, provided by the cooperative, which may be substituted with native grass or rice straw when available (Table 8-14).

Table 8-14. Feed costs in Scheme 4 loans

No	Parameters	Glodog	Leran Kulon	Gesing
1	Total feed cost (IDR/head/period)	1,970,022	2,451,427	2,955,033
a	Total native grass (IDR per head/period)	74,880	-	112,320
	Amount of native grass per day (kg/head)	12	-	12
	Price of native grass (IDR/kg)	104	-	104
	Number of days	60	-	90
b	Total rice straw (IDR per head/period)	47,142	75,427	70,713
	Amount of rice straw per day (kg/head)	5	4	5
	Price of rice straw (IDR/kg)	157	157	157
	Number of days	60	120	90
c	Total complete feed (IDR per head/period)	1,848,000	2,376,000	2,772,000
	Amount of complete feed per day (kg/head)	7	9	7
	Price of complete feed (IDR/kg)	2,200	2,200	2,200
	Number of days	120	120	180

The cooperative buys the concentrate from Bima Feed at the price of IDR2000/kg and sells it to farmers about IDR2200/kg. During harvest farmers can pick up 700 kg of rice straw requiring two labourers at about IDR50,000 per day per labourer, plus the cost of fuel at IDR10,000, with a total price of rice straw estimated at IDR157. The cost of native grass is estimated at IDR104 as assumed in the representative household analysis (Section 5.4.1).

Pen costs

In Glodok, farmers use an individual pen with a cost of about IDR11.9 million and depreciated at about IDR1 million per year or IDR363,000 per period (4 months). The farmers in Leran kulon hire the land on which the pen is built that costs IDR1.5 million per year, with the built cost for the pen at IDR70 million and a 10-year life, it is depreciated at IDR8.5 million per year. The farmers' group in Gesing rent the pen from a farmer that costs IDR100,000 per month.

Credit costs

Each farmers' group except Gesing received IDR300 million (the Gesing group got IDR225 million), with the interest rate ten percent per year. In addition, farmers also have to pay administration costs at 0.8% of total credit received. The contract for cattle fattening is about 4 to 6 months, however if their business is concluded in 4 months, they do not need to pay interest for the other 2 months. Opportunity cost of using their own capital is assumed at 4.25% per year based on the interest rate of term deposits with BRI.

Profitability

Cattle fattening conducted by these three farmers' groups is profitable with a net profit about IDR482,640; IDR46,119; and IDR36,067 per group, per day, for Glodok, Leran Kulon, and Gesing respectively (Table 8-11). However, when all costs are included (labour, feed etc.), only Glodok generated a profit which was about IDR346,743 as the other groups had high unpaid labour and feed costs.

In Glodok, the profit is divided between the three farmers who managed the loan. Although the group has 23 members, only three farmers utilised the loan. In this case the group applied on behalf of the farmers to satisfy cooperative requirements. The cash surplus for each farmer was about IDR160,880 and profit IDR115,581 per day (full budget). These three farmers shared their profit by hosting all group members to dinner.

In Leran Kulon, the net profit was not divided among 23 farmers because the leader of the group managed the cattle by himself and paid a member as a labourer. The profit is

only for the leader which was about IDR46,119 (cash surplus) but minus IDR11,542 per day (full budget).

For the farmers in Gesing, 80% of the profit was divided between the five farmers who invested additional money in the fattening business (about IDR5,771 in cash surplus but minus IDR139 per farmer in the full budget). The residual 20% was divided between the remaining 15 members (IDR481 cash surplus but minus IDR12 according to the full budget).

The profitability of cattle fattening conducted by these groups is questionable (negative for the full budget and account for unpaid costs) but supported by the cooperative through links to the cattle producer and the feed supplier. These links enhance the potential for profitability however, this will depend on the cost of production inputs.

8.5.3. An Assessment of Scheme 4 Loans

In general, Scheme 4 is similar to Scheme 2, which involved other agribusiness actors involved in the contract between farmers and the finance source. The analysis highlights several strengths and weaknesses of this scheme.

Sustainability

The critical factor for this type of loan is that it is dependent on one company. Should the company move, cease operations, or change their position, funding may no longer be available. However, if the cooperative can continue to operate effectively with the existing funding this will not be an issue for funds already allocated.

Availability and price of inputs/outputs for cattle fattening impacts on the income generated by farmers. The role of the cooperative and farmers' group helps to reduce the risk of failure in loan repayments and leads to the sustainability of cattle fattening.

Accessibility of credit

In terms of accessibility, this type of credit scheme is more accessible for farmers who are involved in groups and are a member of the cooperative. However, this scheme limits the access of other farmers who live outside the area defined by the company and who are not members of the cooperative.

Alignment with the objectives of the program

The cooperative strictly controls the use of funds and helps farmers purchase inputs, reducing the likelihood that the money will be used for other business.

Risk

Links with a cattle producer who can ensure the marketing of production inputs/outputs reduces the risk of failure in the fattening operation as marketing is a critical issue. The link between farmers and the cooperative helps them manage contracts, and provides inputs and market access, thereby sharing production costs such as transportation, creating better outcomes for farmers, and reducing risk of default due to inexperience.

Loan timing

Even with the links between farmers and agribusiness, there can still be delays within the fattening operation. However, in this scheme the loan duration is not affected. Farmers only pay interest for the duration of the loan allowing them to benefit if fattening is finished within 6 months.

Beneficiaries of these loans

The availability of loans in this scheme benefits both borrowers and the cooperative. It encourages the development of new businesses such as a feed market or transport businesses to facilitate farmers transferring their cattle from and to the cattle producer. However, the scheme can be for the benefit of individual farmers.

8.6. Scheme 5. Growing Farmer Access to Credit with Two Agribusiness Links

Scheme 5 is offered by a company (Section 7.5.2) and is designed to improve the income of farmers in their operational area. Farmers who have already accessed funding through Scheme 5 are directed to Scheme 6 (Section 8.7).

8.6.1. Loan Processes and Linkages for Scheme 5 Loans

Loan requirements

To qualify for this scheme, farmers in a 10-member group have to be active, have close ties with PKM and DBM (Section 7.3.1 and 7.3.3), and be involved in some cattle fattening training conducted by PKM. Once accepted, the farmers' group will have the opportunity to use the company's pen for one year and they have to follow the defined pen usage rules.

To apply for credit from the Bank (BRI), farmers have to provide documents including a copy of their identity cards, marriage certificates, tax file numbers, business certificates, and a certificate of residence from the village leader (Table 6-7). All these

documents are prepared as a group and assisted by the Bank. Due to the partnership arrangement between the Bank and the company, farmers are not required to provide collateral.

Linkages and institutional arrangements

The linkage process within this scheme (Figure 8-7) begins with assistance provided by their company (part of their CSR program) through their partners (PKM and DFAT) (Arrow 1 and Arrow 2). Then, the application form is submitted to the Bank (Arrow 3). After assessment, the loan is distributed to the Bank account of each farmer (Arrow 4), however, farmers do not have the authority to access the funds.

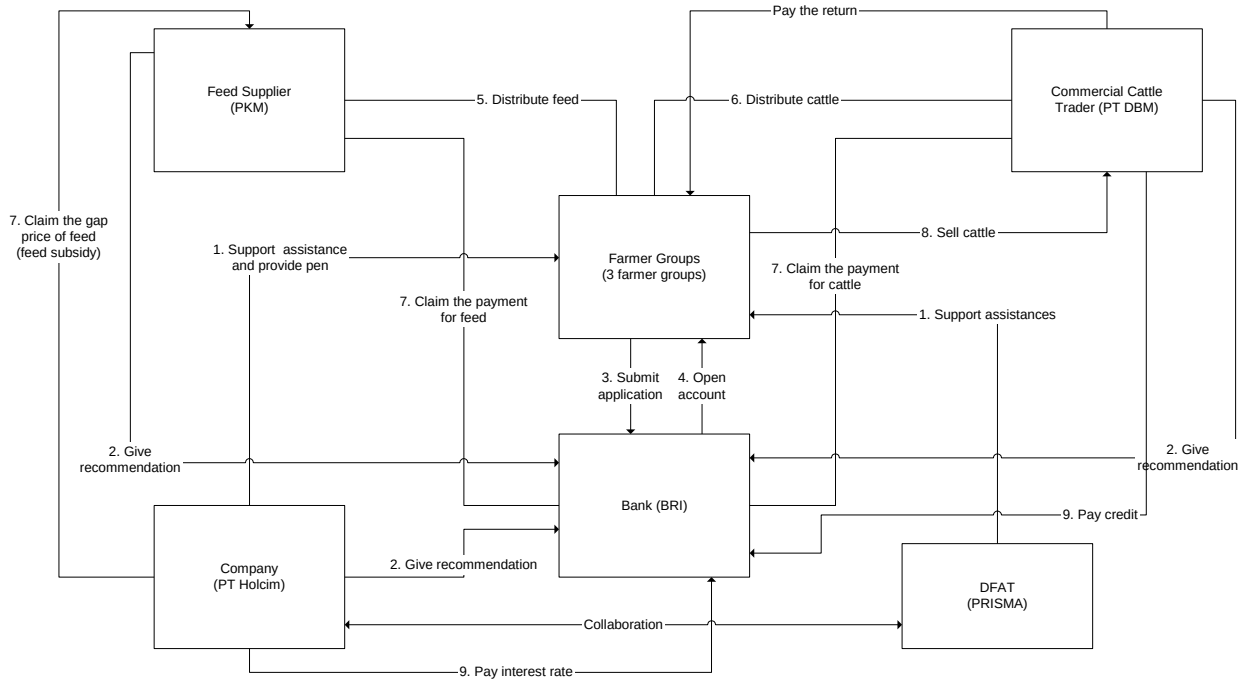


Figure 8-7. The process of applying for credit in Scheme 5 loans

At the same time, the Bank will contact input suppliers (PKM and DBM) to provide feed and cattle to the farmers (Arrow 5 and 6). Once the cattle and feed are received, input suppliers claim payment from the Bank (Arrow 7), the Bank will transfer the money from the farmers' account to the suppliers. After the fattening period, farmers contact the cattle supplier to sell the cattle (Arrow 8), and the supplier returns the funds from sale directly to the Bank with the company paying the interest due (Arrow 9), while the remaining income from selling cattle is allocated to the farmers' accounts as profit (Arrow 10).

8.6.2. Budget Analysis of Scheme 5 Loans

Table 8-15 shows the budget analysis for households involved in Scheme 5 loans.

Table 8-15. Budget analysis for cattle fatteners involved in Scheme 5 loans

No	Parameters	Cashflow	Full Budget
	Number of days in fattening period (days)	120	120
	Number of cattle fattened (head)	30	30
A	**Revenue**		
1	Finished cattle sold (IDR)	650,700,000	650,700,000
2	Manure (IDR)	-	2,880,000
3	Biogas (IDR)	0	0
	Total revenue	650,700,000	653,580,000
B	**Non-Capital Costs**		
1	Feeder cattle (IDR)	540,000,000	540,000,000
2	Labour (IDR)	-	9,000,000
3	Veterinary services (IDR)	-	3,060,000
4	Feed (IDR)	72,000,000	83,060,100
5	Manure (IDR)	-	420,000
6	Depreciation of biogas installation (IDR)	-	-
7	Depreciation of pen (IDR)	-	11,111,111
8	Other cost	1,500,000	1,520,000
a	Communication (IDR)	-	20,000
b	Transport (IDR)	1,500,000	1,500,000
9	Weight loss (IDR)	13,500,000	13,500,000
a	Purchase loss (IDR)	13,500,000	13,500,000
b	Sale loss (IDR)	-	-
	Total Non-Capital Costs	627,000,000	661,671,211
	Per group		
C	**Gross profit per fattening period**	23,700,000	-8,092,055
	Gross profit per head per day	6,583	-2,248
	Gross profit per day	197,500	-67,434
	Per farmer		
C	**Gross profit per fattening period**	2,370,000	-809,206
	Gross profit per head per day	658	-225
	Gross profit per day	19,750	-6,743
D	**Capital Costs**		
1	Interest per period (IDR)	-	18,000,000
2	Application cost (IDR)	9,600,000	9,600,000
3	Opportunity cost of own capital (IDR)	-	9,374,570
	Total Capital Costs	9,600,000	36,974,570
	Per group		
E	**Net profit per fattening period**	14,100,000	-45,066,625
	Net profit per head per day	3,917	-12,519
	Net profit per day	117,500	-375,555
	Per farmer		
E	**Net profit per fattening period**	1,410,000	-4,506,662
	Net profit per head per day	392	-1,252
	Net profit per day	11,750	-37,556

Feeder and finished cattle prices

Each member in the group receives three head of cattle or 30 head of cattle per group, with a body weight of 400 kg. The price of feeder cattle is defined at about IDR45,000 per kg through a contract with DBM. Farmers sell the finished cattle to the same supplier at a price of IDR45,000 for the initial weight and IDR41,000 for the weight gained per head of cattle. Based on the survey, the average ADG was about 0.75 kg/day.

Marketing costs

Transportation costs occur when the cattle are transported from the supplier to the pen which is about IDR50,000 per head. The transport on sale is the supplier's responsibility. Communication costs are estimated at about IDR20,000, and is funded by company. It is only included in the full budget. There is a weight loss up to 10 kg per head in feeder cattle which is covered by the farmer (about IDR13.5 million). However, the weight loss on sale of cattle will be covered by the supplier as cattle are weighed in the pen.

Manure costs

It is assumed that the production of manure is about 36,000 kg (10 kg/day). The price of selling manure is estimated IDR80 and loading for transport requires two labourers, seven times, with the cost of labour being about IDR30,000 for each person.

Labour costs

Cattle are kept in a communal pen and members manage the cattle together with three farmers per day appointed to feed the cattle and see to their welfare. This work is unpaid but, in the full budget, the wages of labour for keeping cattle is based on a standard farming wage (Section 5.4.1.) about IDR25,000.

Veterinary costs

In this scheme, veterinary costs are covered by the company, so the cost is not included in the cashflow analysis. However, in the full budget, the total cost for veterinary services is estimated at about IDR850 per head, per day. The cost of vitamins, minerals, and veterinary visits are about IDR12,000, IDR10,000, and IDR50,000.

Feed costs

Farmers who are involved in this scheme feed native grass, rice straw, and concentrate, based on a contract with the input supplier, as shown in Table 8-16.

Table 8-16. Feed costs in Scheme 5 loans

No	Parameters	Cashflow	Full Budget
1	Feed cost (IDR/head/period)	2,400,000	2,768,670
a	Total native grass (IDR per head/period)	-	49,920
	Amount of native grass per day (kg/head)	8	8
	Price of native grass (IDR/kg)	-	104
	Number of days	60	60
b	Total rice straw (IDR per head/period)	-	78,750
	Amount of rice straw per day (kg/head)	3.5	3.5
	Price of rice straw (IDR/kg)	-	375
	Number of days	60	60
c	Total concentrate (IDR per head/period)	2,400,000	2,640,000
	Amount of concentrate per day (kg/head)	10	10
	Price of concentrate (IDR/kg)	2,000	2,200
	Number of days	120	120

It is assumed that these farmers use concentrate AA02 (12% of protein, IDR2200 per kg) (Section 7.3.3). However, farmers pay only IDR2000 per kg of concentrate and the rest (IDR200 per kg) is subsidised by the company. Native grass and rice straw used as additional feed are assumed to have similar cost to that used in the representative household budget (Section 5.4.1).

Pen costs

The company built the pen for farmers at a cost of about IDR2 billion with a 30-year life. The depreciation of a pen, per fattening period (6 months), is estimated at IDR11 million. This cost is expensive due to the quality of construction of these pens.

Credit costs

Total credit received by the farmer is about IDR60 million (IDR600 million per group) with an interest rate of nine percent. However, the interest rate is paid by the company, with the farmers only required to pay out the loan. The cost of credit includes administration costs (IDR300,000) and cattle insurance (IDR11,000 per million of credit for a period of six months or total about IDR825,000). The opportunity cost of using their own capital is assumed to be the effective interest rate of a BRI term deposit of 4.2% per year.

Profitability

Gross and net profit received by the farmers' group in this scheme is about IDR197,500 and IDR117,500 per day. These figures mean that the cattle business conducted by farmers is feasible. Loans received by farmers without paying interest gives a positive profit, which may allow farmers to expand their scale of production over time

(Mahendri 2009; Setyari 2012; Dahri et al. 2015). The involvement of agribusiness ensures the supply of feed, feeder cattle, and access to the market for finished cattle also affects the profit gained. The cattle supplier provides a certain market and shares costs (weight loss in transferring finished cattle to market). In addition, inputs such as pens, veterinary costs, and feed are subsidised by the company reducing the production costs paid by farmers.

However, when all input costs are included in the analysis, the gross and net profits of this business become negative at -IDR67,434 and -IDR375,555 per day, respectively. The most costly component is the pen which cost about IDR1 billion for 320 head capacity. According to the sensitivity analysis in Section 5.4.2, an increase in the interest rate from 6% to 9% for large fatteners (more than 20 cattle) would reduce profit by about 1.2%, suggesting that, in this case, interest rates might not significantly influence profit (or loss). However, capital costs including interest in this scheme are only 5% of total cost of production, while Sugiarto and Wiryono (2007) reported that credit costs are less than 1%, with 55% of that cost to prepare the loan application.

In this scheme, profit sharing between members of group is a concern. Farmers who have cattle with high ADGs feel it is unfair to share their profit with those achieving less ADG per head. This may trigger experienced farmers to become more independent and build their own business at home and provides more opportunity for new farmers to be involved in the scheme.

8.6.3. An Assessment of Scheme 5 Loans

Sustainability

This scheme depends on the existence of the company to support the program with subsidies. Without this support, the benefits gained and impact on the sustainability of cattle fattening may be reduced.

Accessibility of credit

Due to the partnership agreement between the company and the Bank, the access to credit is limited to farmers associated with the company, chosen by PKM and DBM. The Bank can reduce transaction costs as the borrowers have already undergone first screening by the agents above. The scheme is also limited to a maximum 100 farmers per year, due to pen capacity. However, if the farmers utilise the pens for more than one fattening period, the number of farmers involved in this scheme can be higher. If the company program ends, the opportunity to access credit will be reduced.

Alignment with the objectives of the program

In this scheme, farmers do not have authority to withdraw the money lent to them from their own accounts, reducing the opportunity to utilise funds for purposes other than cattle business. This aligns with the aims of the company's CSR fund and fulfils a Government objective to increase incomes within the community.

Risk

The link to agribusiness in this scheme ensures the availability of feeder cattle at a certain price and provides a certain market for farmers to sell their finished cattle (Sugiarto 2011). Assistance and training provided by the company and technical research agencies will also reduce the risk of failure and increase the profit generated by farmers. As a result, the Bank will be more likely to finance this business.

Loan timing

Due to the relationship with the company, the Bank may also process the application quickly. Transaction time and costs are reduced as screening has been undertaken by the company and suppliers. Once the loan is disbursed, farmers can purchase the cattle directly from the contracted cattle supplier, so there will be fewer delays in starting the cattle fattening period.

Beneficiaries of these loans

As discussed previously, farmers get considerable benefit from this scheme, especially new farmers with less experience in cattle fattening who wish to improve their skills in this business. However, the scheme is limited to farmers who are located in the operating area of the company. Therefore, if other companies can replicate this model, this may enhance outcomes and more farmers could receive benefits from CSR funds.

8.7. Scheme 6. Developed Farmers Access to Credit with Two Agribusiness Links

There are two farmers' groups in Jenu and Kerek Sub District, Tuban District considered as representative of developed farmers' groups. The Company (Section 7.5.2) collaborates with partners PKM, DBM (Section 7.3.1 and 7.3.3) and DFAT (Section 7.5.3) through the PRISMA project which connects farmers' groups to the Sinarmas Bank.

8.7.1. Loan Processes and Linkages for Scheme 6 Loans

Loan requirements

To apply for this credit, borrowers must join a farmers' group, actively participate, and have a good relationship with PKM who will provide a recommendation to access the Bank. Cattle fattening farmers also have to be involved in training conducted by the company, through PKM and DFAT. Documentation must be collected and submitted (as discussed in Table 6-7, Section 6.4.1), including a budget prepared by the Bank which contains an estimate of funds required to buy cattle and feed. All documents are prepared together in groups and it took about three months to process them as it was a new program for Bank Sinarmas.

Linkages and institutional arrangements

Linkages within Scheme 6 (Figure 8-8) begin with assistance and a recommendation provided by the company (through their CSR program) with PKM and support from DFAT (Arrow 1 and 2). At the same time, the Bank will assist farmers prepare loan applications to the point of submission (Arrow 3). After the Bank approves the application, farmers are required to open a Bank account with a minimum deposit of IDR20,000, with the loan going directly into that account (Arrow 4). However, farmers cannot access this money, as the Bank will transfer money from the farmer's account to pay for inputs once the transaction has been made.

Farmers accompanied by Bank staff choose and weigh cattle at the supplier's place, and these cattle are delivered one day after selection (Arrow 5). At this time the Bank will also contact the feed supplier to deliver feed (Arrow 5). After delivery of the cattle and feed, input suppliers send their invoice to the Bank for payment (Arrow 6), with the Bank transferring the money from the farmer's account.

Once fattened, the farmers contact the cattle supplier and the Bank to sell the cattle (Arrow 7). The cattle supplier will deposit the proceeds of sale with the Bank (Arrow 8), and, after costs are deducted, the balance of the income is transferred to the farmer's account (Arrow 9).

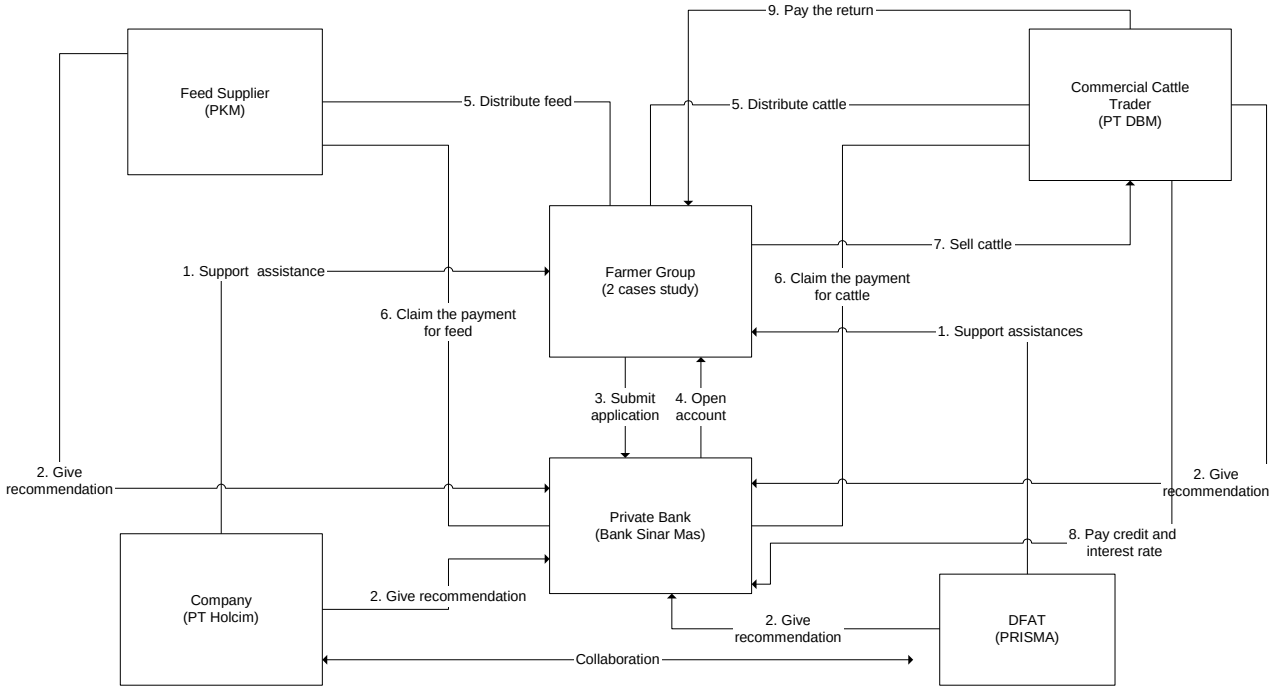


Figure 8-8. The process of applying for credit in Scheme 6 loans

8.7.2. Budget Analysis of Scheme 6 Loans

The budget analysis for Scheme 6 is presented in Table 8-17.

Table 8-17. Budget analysis for cattle fatteners involved in Scheme 6 loans

No	Parameters	Cashflow	Full Budget
	Number of days in fattening period (days)	180	180
	Number of cattle fattened (head)	3	3
A	**Revenue**		
1	Finished cattle sold (IDR)	82,278,000	82,278,000
2	Manure (IDR)	-	432,000
3	Biogas (IDR)	0	0
	Total revenue	82,278,000	82,710,000
B	**Non-Capital Costs**		
1	Feeder cattle (IDR)	63,000,000	63,000,000
2	Labour (IDR)	-	4,500,000
3	Veterinary services (IDR)	366,000	366,000
4	Feed (IDR)	10,800,000	11,379,015
5	Manure (IDR)	-	60,000
6	Depreciation of biogas installation (IDR)	-	-
7	Depreciation of pen (IDR)	-	379,464.30
8	Other costs (IDR)	170,000	170,000
a	Communication (IDR)	20,000	20,000
b	Transport (IDR)	150,000	150,000
9	Weight loss (IDR)	1,350,000	1,350,000
a	Purchase loss (IDR)	1,350,000	1,350,000
b	Sale loss (IDR)	-	-
	Total Non-Capital Costs	75,686,000	81,204,479
C	**Gross profit per fattening period**	6,592,000	1,505,521
	Gross profit per head per day	12,207	2,788
	Gross profit per day	36,622	8,364
D	**Capital Costs**		
1	Interest per period (IDR)	3,375,000	3,375,000
2	Application cost (IDR)	1,125,000	1,125,000
3	Opportunity cost of own capital (IDR)	-	1,725,758
	Total Capital Costs	4,500,000	6,225,758
E	**Net profit per fattening period**	2,092,000	-4,720,237
	Net profit per head per day	3,874	-8,741
	Net profit per day	11,622	-26,224

Feeder and finished cattle prices

The price of feeder for cattle is IDR45,000 per kg with a body weight of about 467 kg. The price of finished cattle is IDR45,000 for the initial weight and IDR42,000 for the added weight. The average ADG is about 0.85 kg/day.

Marketing costs

Similar to Scheme 5, the transport costs of bought feeder cattle is about IDR50,000 per head paid by farmers, while the cost for transporting finished cattle is met by the

supplier. Communication costs are assumed the same as other schemes at about IDR20,000. The weight loss on purchase is covered by farmers and can be up to 10 kg per head (about IDR1.4 million).

Manure price

The production of manure is estimated at about 5400 kg (10 kg/per cattle/day) with the price of manure calculated at about IDR80 per kg. While the cost of manure removal is based on the wages costs to load manure which requires two labourers at a cost of IDR30,000 per person.

Labour costs

Even while the group may apply for the loan together, farmers build their business independently. In this case, the use of family labour is calculated to cost IDR25,000 per day.

Veterinary costs

Farmers give their cattle vitamins at a cost of IDR12,000 per tablet (one time), anthelmintic (every month) at IDR10,000 per tablet and may call the veterinarian at a cost of IDR50,000. In total, veterinary costs are estimated at IDR678 per day, per head.

Feed costs

Farmers involved in this scheme used native grass, rice straw, and concentrate type AA01 (9% of protein, IDR2000/kg) with the amount fed shown in Table 8-18. The distribution of feed costs is spread across 6 deliveries according to input quantities with the amount of feed delivered in the first month less than the second month and so forth.

Table 8-18. Feed costs in Scheme 6 loans

No	Parameters	Cashflow	Full Budget
1	Feed cost (IDR/head/period)	3,600,000	3,793,005
a	Total native grass (IDR per head/period)	-	74,880
	Amount of native grass per day (kg/head)	8	8
	Price of native grass (IDR/kg)	-	104
	Number of days	90	90
b	Total rice straw (IDR per head/period)	-	118,125
	Amount of rice straw per day (kg/head)	4	4
	Price of rice straw (IDR/kg)	-	375
	Number of days	90	90
c	Total concentrate (IDR per head/period)	3,600,000	3,600,000
	Amount of concentrate per day (kg/head)	10	10
	Price of concentrate (IDR/kg)	2,000	2,000
	Number of days	180	180

Pen costs

The depreciation of the pen per period was about IDR379,000. The cost of pen was IDR7.6 million and has a 10-year life.

Credit costs

The total credit received by farmers was about IDR75 million per farmer with the interest rate about nine percent. Application costs consist of administration costs (IDR300,000); and cattle insurance (IDR11,000 per million of credit for a period of six months or total about IDR825,000). Opportunity costs are estimated according to the effective interest rate of a BRI term deposit (4.25% per annum).

Profitability

The gross and net profit generated by farmers in this scheme was about IDR36,622 and IDR11,622 per day. These figures indicate that the business is feasible. However, the net profit becomes negative IDR-26,224 when all the opportunity costs of inputs are included in the analysis. It is recognised that farmers do not spend cash for labour or feed collected from the field, so they may be satisfied with a cash surplus, even if the venture is not profitable when opportunity costs are considered.

Factors that lead to fattening becoming profitable such as a certain market for cattle and experience gained through participation in a group may ease access to future loans to expand their fattening business. The documentation means that farmers have prepared a budget which helps them to manage the loan and reduce the delay in purchasing feed. This will influence the profit gained, however, the interest rate of these loans (9%) reduces the profit for farmers, although this might not be considered significant.

8.7.3. An Assessment of Scheme 6 Loans

This Scheme is similar to Scheme 5, except for the subsidy for pens and feed, and appears more efficient compared to other schemes based on the same parameters.

Sustainability

In this scheme, the availability of credit is more sustainable, not depending on subsidies or any other program. Even the interest rate on loans to farmers reflects a more commercial rate than other subsidised schemes (KKPE). If farmers can improve productivity, by reducing productions costs the business may become more profitable, a creating sustainability for the business in the future.

Accessibility of credit

With knowledge gained from training and experience within the program from BRI demonstrating good outcomes, opportunities to access credit will increase (Sugiarto 2011). Moreover, connections with agribusiness that provide a certain price for inputs and outputs also reduces the risk of business failure. The roles of PKM, DBM, and the company are important in this scheme as they provide a recommendation and link to the Bank which determines the eligibility of farmers to access credit (Sugiarto 2011). As these actors are not guarantors, farmers are still required to provide collateral for the Bank.

Alignment with the objectives of the program

With support from the various actors, and a condition of participation being that farmers are independent, experienced, and involved in an active group, this scheme encourages farmers to focus on the development of cattle fattening. As a result, this limits the misuse of loans for business other than cattle fattening and supports the food security program from government.

Risk

The strength of this scheme is the involvement of agribusiness, the company, research institutions, and other organisations to support farmers' businesses. Farmers are able to reduce the risk of failure as they can access support from those sources and if there is a problem during production, they are available to provide assistance. Moreover, farmers have been required to calculate costs of cattle and inputs, ensuring adequate capital is available to reduce the risk of failure.

Loan timing

In this scheme, the role of Bank staff is important due to their participation in the application process. Bank staff actively communicate with input suppliers and monitor the delivery of inputs thereby providing some surety for farmers and conditions of the loan confirm that interest is calculated from the start of the fattening period.

However, this assistance increases transaction costs for the Bank, and may decrease the supply of credit, as noted by Norton et al. (2010) who claimed that limiting supervision can reduce transaction costs. Farmers' groups may help to reduce this cost, even for individual loans, while the process is done collectively as a group for all activities (loan processing, delivery etc.).

Beneficiaries of these loans

In this scheme, loans will benefit farmers who are conducting cattle fattening businesses. The connection with agribusiness (market certainty) and the company (knowledge from training) helps farmers who may lack capital to improve their businesses.

8.8. Implications of Thesis Findings

Different types of financing schemes have their advantages and disadvantages. Schemes 1 and 3 are profitable but high risk, difficult to access, do not appear to align with Government objectives, have limited beneficiaries and farmers experience delays in disbursal of funds. While Scheme 5 fulfils some criteria, this scheme is not accessible and sustainable in the future. Hence, Schemes 2 and 6 are considered as more sustainable and appropriate models that can be applied in other areas with a low risk, few delays for loan disbursal to start business, provides benefit to all members, is profitable, and aligns with program objectives. Schemes 4 and 5 also have low development risks, are profitable, with little delay in loan disbursal, and align with program objectives, however, these schemes only benefit certain farmers, so therefore are characterized as limited access and not sustainable in the long term.

CHAPTER 9 ASSESSMENT OF CATTLE FATTENING SCHEMES AND RECOMMENDATIONS

Based on the structure of the cattle fattening sector in Indonesia (Chapter 5), the existing supply of financial support for business (Chapter 6), the key actors associated with financing cattle fattening (Chapter 7) and six case studies representing how the system works (Chapter 8), this Chapter provides a comparative analysis of the six credit schemes. The chapter begins with a summary of the six financing schemes (Section 9.1), assessed against seven criteria to examine the efficacy and robustness of those schemes (Section 9.2-9.5). The criteria used are profitability, sustainability, accessibility, alignment with government objectives, risk, terms of loan, and beneficiaries. This enables conclusions and prescriptive recommendations to be made in relation to how credit schemes can be improved to increase the flow of investment into cattle fattening. That may lead to improvements in farmers' incomes particularly in the research areas.

9.1. Assessment of Financing Schemes

As presented in Chapter 8, some schemes align with the objective to develop cattle fattening, but did not demonstrate long term sustainability. Some may reduce the risks associated with business development but are less accessabley. These factors are summarised in Table 9-1.

Table 9-1. Comparison of six credit schemes available in research areas

Type of scheme	Profitability		Sustain ability	Access-ibility	Aligns with government objectives	Risk	Delay in approving loans	Bene ficiaries of loan
	Cash-flow	Full budget						
1	Yes	No	No	Limited	No	High	Delay	Limited
2	Yes	No	Yes	Accessible	Yes	Low	No	All
3	Yes	No	No	Limited	No	High	Delay	Limited
4	Yes	Yes	No	Limited	Yes	Low	No	Limited
5	Yes	No	No	Limited	Yes	Low	No	Limited
6	Yes	No	Yes	Accessible	Yes	Low	No	All

It seems that financing models using subsidised credit from the Government (Schemes 1 and 3) have a high risk of failure and increased likelihood of credit funds being used for enterprises other than cattle. While some of these schemes based on CSR funds, such as Schemes 4 and 5, can fulfil other criteria, the sustainability and accessibility of these schemes are lowest due to company association and subsidy. The more sustainable and most accessible scheme was Scheme 6 with interest rates determined by the credit market and low risk with support from many players (research institutions, farmers' groups, agribusiness). Scheme 2 was also sustainable and accessible with the support of farmers'

groups in accessing loan applications and a focus on credit for cattle. A detailed assessment of each scheme in relation to these criteria follows with recommendations to improve these models later in the chapter.

9.2. Profitability

9.2.1. Assessment and Comparison of Schemes

According to cashflow analysis, cattle fattening is a feasible business for cattle fattening households that can generate a cash surplus between IDR6,011 – IDR1,805,700 per month (Table 9-2). This might be under the poverty line threshold if it was the farmer's sole source of income, but it is a supplementary activity for most households. If farmers can increase the scale of production, by specialising in cattle fattening, they might reach a cash surplus per month greater than the regional poverty line in East Java which was about IDR361 thousand per month in 2018 (Table 9-3). However, fattening cattle under the various schemes is considered unprofitable (with the exception of 4a) when all input components are valued and included in the analysis. This outcome might be influenced by factors shown in Table 9-2 such as ADG, feeder and finished cattle prices, feeding period, and weight loss before sale.

Table 9-2. Profitability of cattle fattening under each loan scheme (IDR/month)

Scheme	Parameters							
	Budget (IDR/month)		ADG	Interest rate	Feeder cattle price (IDR/kg)	Finished cattle (IDR/kg)	Feeding Period (months)	Weight loss before sale (IDR)
	Cash surplus (Cash-flow)	Net profit (Full budget)						
1	790,185	-462,869	0.9	6%	50,000	44,000	5	-
2	1,805,700	-290,957	0.9	9%	45,000	45,000	6	900,000
3	759,791	-666,396	0.6	6%	51,000	44,000	9	-
4a	120,660	86,686	1.2	10%	46,000	46,000	4	690,000
4b	11,530	-2,885	0.9	10%	46,000	46,000	4	690,000
4c	6,011	-145	0.8	10%	46,000	46,000	6	690,000
5	352,500	-1,126,666	0.8	9%	45,000	41,000	4	450,000
6	418,400	-944,047	0.9	9%	45,000	42,000	6	450,000

Table 9-3. Poverty lines in East Java Province in 2013-2018

Year	Month	Poverty lines (IDR/capita/month)
2013	March	250,530
	September	269,294
2014	March	278,429
	September	286,798
2015	March	305,404
	September	318,443
2016	March	323,779
	September	328,846
2017	March	339,537
	September	347,997
2018	March	361,493

Source: Badan Pusat Statistik (2016)

According to cashflow analysis, all schemes provide a positive cash surplus for farmers due to the weight gained the cattle. However, if the weight gain (partly a function of high ADG) is not supported by a high price for finished cattle, many of the production plans are not profitable when all costs are taken into account. Farmers who sold their finished cattle at the same unit price (IDR/kg live weight) as they purchased them were more likely to generate a profit (Scheme 4a).

The price of feeder cattle also affects the profitability of the fattening activity. Farmers in Schemes 1 and 3 who did not have links with agribusiness, bought their cattle from the market (through a broker) based on a visual estimation system that leads them to pay a high price to the seller (Koesmara et al. 2015). This increases the cost of production and reduces profit.

It is not clear what impact the interest rate has on profit. Even farmers that took subsidised loans from the Government (Schemes 1 and 3) or companies (Scheme 5), generated lower profits than some with higher interest rates (Schemes 2 and 4). This might be because of the lower price for feeder cattle and high price for finished cattle received by some farmers (Dahri et al. 2015). The cost of feeder cattle in this study contributes about 81-86% of total costs to fattening these animals, while capital costs including interest is less than 4% of total costs. This is higher than the percentage reported by Sugiarto and Wiryono (2007) at less than one percent. Obviously, if interest rates increase, profits decline.

Farmers with links to agribusiness have to deliver their cattle to the trader's place of business, which may lead to weight loss; a cost borne by farmers. Farmers in Schemes 5

and 6 had lower weight loss costs compared to Schemes 2 and 4, as in these schemes the loss was shared between farmers and buyers.

Under Scheme 4, there are three different ways to distribute profit among the farmers. Farmers in Schemes 4a and 4b received the loan as a group but the loan was managed by three farmers in one case and one in the other, and profits were shared by these farmers. In Scheme 4c, farmers managed the loan together and shared the profit between all 20 farmers. This diminishes the profit earned by each farmer as shown in Table 9-4. This may also be due to the scale of production.

Table 9-4. Profitability of different cases in Scheme 4 loans

No	Village	Cashflow		Full budget	
		Cash surplus per group (per head/day)	Cash surplus per farmer (per head/day)	Net profit per group (per head/day)	Net profit per farmer (per head/day)
1	Glodok (4a)	26,813	8,938	19,263	6,427
2	Leran Kulon (4b)	2,562	2,562	-641	-641
3	Gesing (4c)	4,007	641	-97	-16
			53		-1

9.2.2. Recommendation

A good profit from cattle fattening means business success and this should reduce the risk of failure to repay loans to the bank, thus encouraging banks to lend money for cattle fattening. There are some factors that need to be considered to improve the profitability of cattle fattening. First, increasing ADG, which may be supported through the provision of good quality feed. It can be provided at lower cost; the result is much better. It is suggested that a relationship with a research institution is necessary to support the availability of feeding technology. Moreover, the growth of feed mills or feed banks also needs to be supported. This will provide sustained feed supplies for farmers which is such a big component of production costs.

Second, reducing input costs can impact on the profit generated by farmers. For example, the highest input cost in fattening cattle is the purchase of feeder cattle. The formation of groups can reduce transaction costs where farmers share transport and feed delivery costs.

Another way to support cattle fattening farmers would be to encourage traders, farmers, and agribusinesses to use scales to weigh cattle rather than visual estimation. Evidence suggests that visual estimation only benefits buyers or sellers who have experience in judging cattle weights (Koesmara et al. 2015), while an effective weighing

system is important to determine the body weight and price of cattle (deRosari et al. 2014). The Government may consider providing scales to farmers' groups or installing them within cattle markets to stimulate greater acceptance. Finally, weight loss during transport of cattle could be minimised by providing improved transport infrastructure.

9.3. Sustainability

The assessment of the sustainability of cattle fattening using different types of financing modelling is also necessary to ensure the viability of the cattle business. Even if credit programs successfully generate high profits, the program will not support the development of cattle fattening businesses if it is not sustainable over time.

9.3.1. Assessment and Comparison of Schemes

The availability of subsidies for loans does reduce the capital costs in a budget analysis, thereby increase profits generated by farmers. However, the sustainability of subsidised credit is susceptible to change in Government projects, as occurred with Schemes 1 and 3. Scheme 5 is also not sustainable in the long term, because the company may cease operations in that area or may reconsider how their CSR funds are used in cattle fattening. Scheme 2 involved subsidised credit while the business was still considered viable due to the strong group supporting the farmers in managing these loans.

In the case of Scheme 4, there was no subsidy where the source of the loan is a company CSR fund through a cooperative with a limited quota. Again, if the company ceased to operate, or supported programs other than cattle, the sustainability of the cattle fattening businesses would be affected. However, if the cooperative can effectively manage funds already distributed, the sustainability of cattle fattening businesses should be ensured.

In contrast, Scheme 6 with program credit created and provided by the Bank, the development of cattle fattening business should be sustainable in the long term due to a sustainable source of funding from the financial institution that is not dependent on a government program. It is a scheme, however, where farmers generate a positive cashflow from fattening cattle under the assumptions used but the activity may not be profitable in the sense that all costs are not covered by the revenue.

9.3.2. Recommendation

The recommendation to improve the sustainability of finance for cattle fattening is to reduce the dependency on subsidised credit. Sourcing credit from formal markets such as

Banks, which offer non-subsidised loans (up to 13% interest rates) for fattening business can be viable option. According to the cashflow analysis, all of the Schemes where farmers obtained credit at interest rates between 9-10%, fattening businesses can still generate a cash surplus (Table 9-2). Some even are profitable when all costs are included. In addition, the sensitivity analysis in Section 5.4.2, suggests that farmers still receive a positive cashflow even if the interest rate is increased, to 13%, as long as other parameters such as ADG and the price of cattle are favourable.

It can also be suggested that increasing the supply of money to banks for fattening, by increasing the source of funds from third-parties in the form of giro, saving and deposits could increase the sustainability of finance for fattening. Moreover, Government should intervene to encourage Banks in Indonesia as well as companies to consider allocating some of their loan/CSR funds to each sector of the economy, including cattle fattening. It is suggested that companies divert subsidies or CSR funding towards more assistance or training that will allow more farmers to become involved in cattle fattening.

Finally, the role of cooperatives to manage the distribution CSR funds will bring benefits to farmers as evidenced by Scheme 4. In this case, the cooperative, acting as a middleman, can supply the needs of farmers in cattle marketing and utilise the capital from members to help their members.

9.4. Accessibility of Credit

Accessibility of credit is related to the ease of obtaining funds to support farmers fattening cattle. Limited access of credit will reduce farmers' capacity to be involved and this will impact on how financing schemes can be replicated in other areas.

9.4.1. Assessment and Comparison of Schemes

The availability of subsidised credit results in a high demand from borrowers who want to apply for a limited supply of credit. To get credit-worthy customers, the Banks implement rigorous applicant assessment procedures to reduce the risk of loan default, whereby only well-off or large households, with regular off/non-farm income and consequently less risky borrowers, can obtain funds (Adams & Pischke 1992; Buttari 1995; Mahendri et al. 2016). For example, in Schemes 1 and 3 that offers low interest rate loans at 6% interest, the accessibility to credit is limited to farmers who have regular or certain incomes and who already have experience in loan applications (Sugiarto 2011). This can reduce risk exposure and transaction costs for banks when assessing borrowers but does not address equity issues.

Loan requirements for Scheme 4 include approval by members of a group while being a member of a cooperative limits access to credit by farmers outside these groups. In a similar way, Scheme 5 reduces access to loans through limited subsidies and pen access restricted to those farmers known to the company.

However, farmers in Schemes 2 and 6 are independent fatteners and already have experience in cattle fattening but lack the additional capital to conduct and expand their businesses. These farmers are involved in an active group and have a strong will to develop their businesses which will diminish the risk of failure. In addition, linking farmers with companies (as a facilitator to link farmers with a bank) and with agribusiness (to provide input-output market certainty) as in Schemes 2, 5 and 6 increases access to credit.

9.4.2. Recommendation

According to the assessment of credit represented by the six schemes analysed, it is likely that experienced farmers with better knowledge of cattle fattening are more likely to access credit. Therefore, it is recommended to increase the capacity of farmers in cattle fattening which may be achieved by increasing assistance and training, so farmers can use production factors more efficiently. Isyanto et al. (2013) found that education and experience were factors that impact on technical efficiency. Government through livestock services including technical research agencies can collaborate to provide training and assistance. This may have additional costs, but the cost should be lower than the benefit received by farmers. These additional costs have not been included in this study, however, this can be approached by the number of trainers giving assistances (2 persons), frequency (12 times a year); and transportation cost (IDR 150 thousand per day). Training is usually provided for groups of farmers (20 members); so then the cost of training or assistance for one farmer per year is about IDR 7,500. This cost needs to be balanced against the benefits received by farmers, such as the farmers' businesses becoming more profitable due to knowledge obtained from training and better access to bank credit due to the assistance provided in preparing bank applications. The Government can also collaborate with the companies that provide CSR funding for training and assistance. Moreover, coordination between agencies that provide assistance would avoid overlaps in training and reduce costs.

The experience gained by obtaining a loan may assist farmers to access credit in the future. When more credit has been obtained, and farmers have a greater understanding of

the process, they may be encouraged to actively seek more sources of credit (Sugiarto 2011). Therefore, government should promote credit and other program intensively.

Farmers' groups assist with loan applications and can play a role in monitoring loan repayments (Stiglitz 1990). Moreover, Sugiarto (2011) reported that a low capacity to build independent groups in Jember, East Java obstructed farmers wanting to obtain KKPE credit. Therefore, it is important for farmers to apply for loans as a group, but they should manage the loan they obtain for their business individually, so the farmers themselves are responsible to their costs and benefit from any profit.

The connection with agribusiness companies, government agencies and research institutions or other organisations related to cattle fattening, needs to be developed in the future to raise opportunities to access credit. This is important in providing certain markets, guarantees, assistance, and technology to improve cattle fattening. Therefore, banks can link farmers with agribusinesses that already have agreements with them.

9.5. Alignment with Government Objectives

The assessment of financing models in this respect is important to support Government policy in relation to cattle production. Financing cattle production through subsidised credit was initially established to support beef self-sufficiency in Indonesia.

9.5.1. Assessment and Comparison of Schemes

Subsidised credit leads to the high demand for loans and, as stated previously, banks favour borrowers with successful credit histories as required in Schemes 1 and 3. There is also the potential for these loans to be used for things other than cattle, as wealthy farmers see the benefit from low interest loans. In this case, the aim of the program credit to support food security in Indonesia may not align with how the credit is used.

Increasing interest rates for program credit, if combined with the existing ways of involving farmers' groups or cooperative or other agribusiness actors, as currently happens in Schemes 2, 4, 5, and 6, will minimise the possibility of funding being used for other purposes, so the rate of development of cattle fattening generated by these schemes can be maintained. According to the analysis of the six schemes, and the prior sensitivity analysis of changes in interest rate, loans at commercial rates (up to 13% interest) are still viable under favourable conditions. Even with commercial interest rates, there could be more investment by farmers into cattle fattening, which would align with government objectives in beef self-sufficiency.

9.5.2. Recommendation

Program credit established by the Indonesian Government aimed to improve sectors that support food security. To reach this goal, the Government needs to target sectors that can access subsidised credit, including targets for borrowers. Moreover, intensive monitoring and evaluation from banks that can collaborate with livestock institutions (such as identifying the targets and maintaining the business) or through the use of farmers' groups could reduce the misuse of program credit and achieve program objectives.

9.6. Risk

The assessment of financing models against risk criteria is important for banks in distributing loans, as some studies reported that banks are reluctant to invest in agriculture (including cattle fattening) due to the high risk of business failure. Business failure is usually the result of uncertain markets for inputs (feeder cattle, feed etc) and outputs (finished cattle), as well as failure in production itself. The concept of risk sharing has been reported by Newbery (1989) and Meuwissen et al. (2001) and applied in schemes evaluated in this study (such as Schemes 2, 4, 5 and 6). This is discussed in the following section.

9.6.1. Links to Agribusiness

Assessment and Comparison of Schemes

A connection with agribusiness results in the availability of inputs and certain markets for finished cattle. This will support cattle fattening and may lead to lower risks for banks to finance the business. Schemes 1 and 3 have no links to agribusiness, and this results in different outcomes to those schemes that share links as shown in Table 9-5.

Without linkages, farmers receive unpredictable prices and it depends on the capability of farmers to negotiate price and the ability of traders to correctly estimate the body weight of cattle (Ilham 2009; Koesmara et al. 2015). In contrast, under the partnership arrangement, farmers buy and sell cattle back to the supplier at a contract price (Suardika et al. 2015) and an agreed weighing system. This creates greater certainty within the business.

The connection with other actors ensures the availability of feed for cattle and farmers often do not need to spend money on feed as the cost has already been calculated and included in the credit advanced as happens in Schemes 2, 4, 5, and 6. This diminishes the risk of business failure due to a lack of money for feed.

Table 9-5. Differences of financing model with and without links to agribusiness

No	Parameters	Without link	With link
1.	Marketing system	- Farmer buys cattle in local market and sells cattle to village cattle traders	- Farmer buys and sells cattle to the cattle supplier with a contract
2.	Prices	- Unpredictable price depends on the capability of farmers negotiate the price	- Certain price as specified in the contract
3.	Feeding system	- Farmers formulate cattle feed independently that might not be sustainable - Farmer use their own money to buy cattle feed	- Certain availability of feed as in a contract with feed supplier - Feed cost is covered by loan funds
4.	Access to credit	- Need personal collateral - High risk for bank	- Company ensures farmers - Low risk for bank

Links with agribusiness or other companies also helps farmers to access credit from banks as occurs in Schemes 2, 4, 5, and 6. These businesses can identify high-worth farmers and banks are likely to be comfortable dealing with them (DFAT 2015). Through recommendations provided by agribusiness and as guarantors, risk for banks is reduced.

Some agribusinesses may also share the costs of cattle fattening such as transportation costs and weight loss with households. In Schemes 2, 4, 5, and 6 that have links with cattle suppliers, farmers pay for the transport from supplier to their pen, but the supplier bears the transport cost from farm back to the supplier when cattle are sold. However, only in Schemes 5 and 6 do farmers share the weight loss of the cattle with the supplier.

Recommendations

The link between cattle fatteners and agribusiness occurs mostly in Tuban, so it is possible that this could be replicated in other districts in East Java and more broadly in Indonesia. It needs traders, butchers, and large cattle producers to support farmers in providing access to loans through these partnerships. The agribusiness actors have a close connection with cattle fatteners and know which farmers are effective. Banks can also help farmers who want to apply for credit by introducing them to input suppliers that collaborateions with the bank.

A key recommendation from this study is that providing farmers with information about the cattle market including prices and choice of cattle would be beneficial. The Government needs to encourage farmers to sell their cattle in markets where they can be weighed, not based on visual estimates.

Moreover, the Government needs to provide infrastructure for farmers such as providing scales in the villages; better transport facilities to reduce the weight loss of cattle; and the construction of slaughter houses in the area (maybe in each district), to reduce transport times.

9.6.2. Links with Government (Livestock Institutions)

Assessment and Comparison of Schemes

The training provided by livestock institutions is important to enhance farmers' knowledge about cattle operations. This may help to reduce the business failures that impact on the profitability of the fattening sector. In all schemes, training in cattle production is a compulsory condition when applying for a loan, even in Schemes 4, 5, and 6, where the training is conducted by the company (not a livestock institution).

Moreover, farmers in Schemes 1, 2, and 3 actively participate in the Government's program. As a result, lots of grants can be distributed to these farmers. They also get a recommendation letter as needed to apply these for loans, and especially for program credit. However, the recommendation does not ensure farmers will get a loan from the banks.

Recommendations

The relationship between farmers and livestock agencies needs to be improved, firstly, by providing more intensive assistance to farmers. Consultation between farmers and livestock agencies should not only occur when the institution needs to establish a program or project that requires the participation of farmers' groups. Even if this leads to higher costs, it should still be considered.

Second, livestock institutions can collaborate with other companies and institutions who already participate in providing assistance for farmers involved in cattle fattening. In Schemes 5 and 6, where the company already provides assistance in cattle production, there is limited access to veterinary assistance. Livestock institutions can be involved in this aspect because farmers learn how to deal urgently with sick cattle, but they do not have the capacity of veterinary staff who are mostly based in livestock institutions to treat these animals. Third, institutions should encourage farmers to join a farmers' group, which may reduce reliance on other actors for training and information as farmers readily learn from each other. Finally, institution should also encourage more households to specialise in fattening cattle so then it can increase the productivity and return from cattle as well as regarded cattle as a primary source of income for farmers, not only as a secondary

occupation as in current situation. In addition, targeting professional/specialised operations is likely to lower the risk of failure in cattle fattening businesses.

9.6.3. Links with Research Institutions

Assessment and Comparison of Schemes

There is little support from research institutions including the University within the research areas, unless the farmers are involved in an active group. Research institutions have limited budgetary resources to introduce technology to farmers, particularly for following up the results of their technological applications. At the same time, farmers will use the technology when there is assistance provided by research institutions. However, when these programs end, farmers often return to their previous activities. Each research institution works with part of the population, and sometimes different institutions offer the same program to the same farmers, so that few farmers benefit from them.

Recommendation

It is suggested that links with research institutions be improved, especially in providing technology to support cattle fattening and assisting farmers to estimate profits which is an important assessment for the banks. Moreover, compromises and collaboration are needed between research institutions or with Universities when applying for projects, so that support can be sustained over time and costs reduced through a sharing of responsibility between institutions.

9.6.4. Links with Farmers' Groups

Assessment and Comparison of Schemes

Farmers involved in Schemes 1 and 3 developed groups due to requirements associated with applying for subsidised credit and these groups are less active, indicated by a lack of activities that benefit members. In contrast, farmers in four other schemes have been more active and have a strong group of members who have regular meetings to discuss problems in cattle fattening. Active groups gain access to grants and assistance from Government such as loans from banks and support from other institutions.

Different types of credit have different application requirements. For KKPE, applying for program credit can be completed as a group or individually, while KUR or other program credit from banks requires an individual application. There are some differences between accessing individual and group applications for credit as shown in Table 9-6.

Table 9-6. Differences between accessing credit individually and in groups

No	Parameters	Individually	In group
1.	Loan application	Loan processing is faster especially for farmers	The process is slower because the batch can be held up by individual details/documents
2.	Trigger a competitive business	There is no competition in the group	The success of one member might trigger other members to do the same thing
3.	Processing cost	Higher cost	Shared cost for loan application
4.	Efficiency for banks	Less efficient	More efficient, even if banks still need to visit each farmer's pen
5.	Raising cattle	Small production scale but every farmer is responsible for their own business	Large production scale but it leads to conflict of interest between members in sharing profit and responsibility

It seems that applying for credit individually provides benefits in terms of time to process applications and the responsibility of raising cattle. The process of applying for an individual loan is faster as there is no need to wait for other farmers' applications to be submitted to the bank. The process will take longer if the application is made as a group, but one person has not completed the requirements. Other members will need to wait until all farmers are ready with their documents. This is usually related to collateral that needs to be raised. Raising cattle individually encourages farmers to be more responsible for their business and reduces conflict of interest between farmers in regard to sharing profit and responsibility.

In the case of Scheme 2, the farmers group is an active group, so they prepare and submit the credit application together as a group, but each farmer has their own application. When they receive the loan, these farmers managed their own personal credit, but the group helps provide cattle feed, veterinary services, and other assistance. Another example is also seen in Schemes 4a and 6, where the farmers apply for credit in a group for their personal application.

Recommendation

The recommendation here is that the existence of a farmers' group should be compulsory for farmers who apply for credit, and this conforms with the outcome of other studies (Sugiarto 2011; Dahri et al. 2015). The role of farmers' groups is important when preparing documents needed by banks, especially for farmers who lack knowledge or experience in completing bank applications. It also reduces loan preparation costs as the group may appoint one person to do the preparation (apply for recommendation letter etc.)

for all farmers and share the cost. Groups also help members by providing inputs to production and marketing systems which can lead to lower production costs. In addition, the group can monitor each farmer loan repayments, as in Schemes 2, and 4. There farmers cannot apply for credit if one of their members still has liability to repay a loan. Therefore, empowering and strengthening farmers' groups is needed in the future as it leads to more efficient use of borrowed funds and farmers become more responsible for their loans.

9.7. Lending Arrangements

The analysis of lending arrangements including timing of loans, credit limits, loan requirements, and repayment terms are important in this assessment. The objective o improve financing models, should be supported by appropriate arrangements for credit productsthat align with the needs of farmers.

9.7.1. Loan Timing

Time is an important consideration in developing cattle fattening businesses because of fluctuating cattle prices. Misalignment between disbursement of credit and the seasonal price of cattle impacts on farmers profits (Dahri et al. 2015). For example, if the farmers get their loan when the price of feeder cattle in the market is lower, this can benefit the farmers, but if the price is too expensive, sometimes farmers need to wait until they get cattle at a lower price and this may affect repayment of the loan.

The uncertainty related to time was evidenced in the analysis of Schemes 1 and 3 because there is a high possibility of delays in starting the business after receiving the loan, but farmers are still required to pay the interest. This is also possible in Scheme 2, but due to the strength of group, this delay can be minimised by collectively purchasing cattle, so they can share the price using loan funds from all members.

In Schemes 4, 5 and 6, farmers utilise the loan efficiently, because they start after cattle have been received from the supplier. If cattle are not available, they do not need to pay the interest for that time. In this case, the collaboration between supplier and the bank is really important.

To minimise the effect on profit due to misaligned times between distributing the loan and the start of the feeding period, it is recommended that reporting market information related to price, and availability of cattle be considered. One way to do this is by encouraging contracts with agribusiness. Farmers who want to apply for credit should contract with traders or input suppliers who can provide certainty about the time to start the

fattening business. As a result, banks can adjust the time to distribute loans to farmers. This happened in Scheme 6 where banks coordinate with the supplier before disbursing the loan to farmers.

9.7.2. Credit Limits

There are several types of credit offered to farmers to support their cattle fattening operations as discussed in Table 6-5 in Section 6.3.2. The difference in credit limits impacts on the use of the money. In Scheme 1, farmers use all the loan (IDR50 million) to buy cattle, consequently they have to have their own money for feed or veterinary costs. Scheme 3 allocated a small loan to each farmer (IDR10 million), that was not effective, especially for those farmers who do not have additional capital to provide feed and for other expenses.

In Schemes 2 and 4, groups and cooperatives help farmers to manage their loan by purchasing cattle and feed. While in Schemes 5 and 6, the loan is already separated for cattle and feed. However, veterinary expenses appear to be neglected but can support the achievement of higher ADG for cattle.

It is recommended that banks adjust credit limits according to the market price of cattle. Banks can get this information from the budget plan submitted by farmers when applying for credit. The separation of loans into parts for cattle and feed as in Schemes 5 and 6 may also be a consideration.

9.7.3. Credit Requirements

Another aspect is related to loan requirements. Based on this research, there is no difference between the requirements for program credit and other types of credit offered by the banks, with the exception that program credit requires a recommendation letter from a livestock institution and a livestock training certificate (Schemes 1, 2 and 3). Moreover, farmers in all schemes must provide a business certificate that is approved by village officials. These documents can help the banks to screen credit-worthy borrowers. However, the letter from the livestock institution is not a guarantee of a successful application and the process to gain one usually takes a long time depending on the availability of a person who has authority to sign the letter.

In the future, these requirements should be kept as livestock agencies should understand more about the condition of farmers in their areas, and this will help banks to choose which borrowers they lend to. However, it is suggested that there should be improvements to the processing time for providing these recommendation letters.

In addition, supporting letters from village officials also help the banks to assess the character of farmers, because village officials are close to farmers and have access to documents, and information. The process to provide these documents does not take long because there is an effective connection between farmers and village officials, particularly when the person who processes those documents in the village is also a member of the farmers' group that is applying for credit. This relationship should be maintained in the future, and it is suggested that village officials be helped to improve their performance in supporting the cattle fattening business.

9.7.4. Repayment Terms

The repayment of loans for cattle fattening is based on the fattening period which is about 4-6 months depending on the contract with the bank. This flexible repayment term helps farmers who usually keep their cattle for 4-6 months (Sugiarto 2011). In the future, repayment terms based on the production period should be encouraged.

In Scheme 3, farmers received their loans in February and have to pay the interest in September (after 7 months) and return the principal in December (10 months). If farmers conduct two fattening periods of 6 months, the second period will end in February the following year, which means they would need additional money to cover the loan repayment in December before the second lot of cattle are sold. Therefore, in the future it is suggested that loan timing and repayment are aligned with the start of fattening. Then this will reduce the failures in loan repayment.

9.8. Beneficiaries of Loans

Subsidised credit by the Government aims to support farmers to develop and expand cattle their fattening business and to increase their incomes. However, a different arrangement of credit might affect the beneficiaries of loan. This section shows how cattle credit in each scheme benefits farmers and provides a recommendation that can be used to increase the benefits of loans for farmers.

9.8.1. Assessment and Comparison of Schemes

Being in a farmers' group helps farmers to access credit, but in some cases, it can lead to an imbalance in benefits among the farmers. There are some farmers who access credit in a group as in Scheme 1. That usually leads to the creation of a group, just to apply for program credit with a low interest rate from a bank (Patrick et al. 2010). Sometimes, a dominant farmer (usually a leader) will keep the funds for their own

requirements. A similar situation also exists in Scheme 4, where farmers access credit with approval from the group, but only three persons (Section 8.5.1. sub (i), case study in Glodog village); or the leader (Section 8.5.1. sub (iii), case study in Leran Kulon village) used the loan. As a result, not all farmers received benefits from the loan.

Scheme 3 also limits the benefits of obtaining credit to the same farmers' group who have received program credit previously, unless they no longer wish to apply for credit, in which case another group may access it. In Scheme 5, the benefits of the loan are limited to new farmers with less cattle experience, due to the limited subsidies provided by the company.

Different to that scheme, beneficiaries of loans in Scheme 2 are not only farmers who have obtained credit from the bank, but all members in the farmers' group, even if they did not formally apply for credit. Famers who obtained credit can share their loan with other members, especially those who cannot provide collateral, and this type of loan is managed by the group. Similarly, loans distributed in Scheme 6 also benefit farmers who have already been involved in cattle fattening but lack capital to develop their businesses further.

9.8.2. Recommendations

It is suggested that applying for loans for cattle fattening can be individual but should require some institutional input (from a farmers' group). Famers have to be responsible for their own loanss and should only use the group for collectively transporting cattle, bulk feed purchasing, passing on information, or providing assistance to complete loan applications. Groups also simplify the process for Government or other related institutions that provide training and assistance for farmers (Elly et al. 2008). In the case of loans managed by a group, there should be an agreement between members, so they can benefit by the loan to increase their income, because they all carry the same risk in applying for credit.

The other recommendation is to develop a "partnership" or plasma-nucleic system between companies and farmers to allow the opportunity for more farmers to apply for loans, especially those who have less experience in cattle fattening and less understanding of the loan application process.

CHAPTER 10 CONCLUSION

This study examined the role of finance in the development of small-holder cattle fattening in Indonesia, particularly in East Java. While previous studies have focused separately on technical, financial, and institutional aspects of this issue, this study adopted a holistic perspective, examining the demand for finance from small-holders, the supply of finance from banks and other sources, and the institutional arrangements that have been developed to bring demand and supply together. A comparative case-study approach was used to understand the processes by which cattle fatteners gain access to finance in different settings and to assess the effectiveness of different institutional arrangements. Mixed methods were used including document analysis, key-informant interviews, farmer surveys, and budgeting of cattle fattening activities. While the study was confined to household cattle fattening, it did not examine cattle breeding operations and was mainly based on data from two locations in East Java. The contextual analysis and the cross-verification of the different data sources enabled an accurate picture of the small-holder cattle-fattening sector to emerge and robust conclusions to be drawn. As applied research, the study also provides recommendations that can improve the continued financing of cattle fattening in Indonesia. The key findings are presented in terms of the six research questions outlined in Chapter 1.

10.1. *What is the broad national environment in which "finance of fattening" takes place across the research sites?*

As described in Chapter 4, cattle production in Indonesia, particularly in Java is dominated by small-scale, traditional production systems which rely on local resources (crop by-products and family labour) and are relatively uncommercialised in that they purchase few inputs and make little use of credit. The household cattle-fattening sector, on the other hand, is more commercialised and has undergone significant growth, particularly in East Java. While some farmers have specialised in cattle fattening due to limited land, labour, and other resources, other farmers have added fattening to their on-going cow-calf operation. Fattening households are generally small enterprises but are closely integrated into the markets for cattle and feed.

The development of cattle production in Indonesia is aligned with the Government's objective of attaining national self-sufficiency in beef. One aspect of the policy push to improve cattle production has been supporting farmers with capital. Most capital support for cattle production is formal finance, particularly in the form of grants from Government and subsidised credit from Commercial Banks. Relatively little capital support is derived

from informal markets such as family, neighbours, or village moneylenders as cattle production is typically a secondary activity that farmers develop when they have more income or can obtain a loan with subsidised interest.

Governments and banks have developed several types of credit programs through which credit has been widely distributed. However, access to loans is limited which was only 35% of total KKPE credit (IDR24.7 trillion) during 2012-2015 (Direktorat Pembiayaan Pertanian 2014b) being taken up for a range of reasons. Farmers can face difficulties in writing loan applications while many banks or bank branches are reluctant to fund agricultural activities, including cattle fattening, because it is seen as high risk and involves high transaction costs.

10.2. *What are the determinants of demand for finance amongst cattle fattening households in East Java?*

As analysed in Chapter 5, the demand for finance among fatteners is determined by the way farmers manage their production, the types of inputs and investments required, and the profitability of the business. Over 60% of farmers interviewed in the case-study sites tended to focus on their fattening operation due to limited resources, including land, pens, and labour, while nearly 40% combined cattle fattening with their cow-calf operation. Farmers who had transformed their production system from cow-calf production into more specialised and commercialised fattening were mostly doing so to increase their profits in response to the increased market demand. Some mentioned that they were better utilising their resources, including the calves they produced, the limited pens they owned, and the available feed. Others felt that to access and repay the available credit they needed to generate a faster return than possible with cow-calf operations. The high opportunity cost of holding cows for long periods in a cow-calf operation makes cattle fattening appear less costly and risky.

Cattle fattening in the study sites was dominated by small-scale farmers (up to five cattle with an average two head of cattle), comprising of nearly 80% of the cattle fatteners surveyed. Medium farmers (6-20 cattle with an average 9 head of cattle) accounted for 14% and large farmers (more than 20 head of cattle) for 8%. Small-scale farmers had less interaction with stock, labour and feed markets while medium and large farmers had more market links. Moreover, the marketing of fattened cattle was disadvantageous to the farmers especially small to medium scale farmers due to their poor bargaining position, not knowing the weight gain of their cattle on being in the position of price takers. However, some cases were observed in which a weak bargaining position had changed through the

development of linkages with farmers' groups and agribusiness that provided a more certain market for farmers. Such institutional arrangements reduced the risk of defaulting on loans and subsequent business failure.

The purchasing of feeder cattle was the main capital investment in cattle fattening and was required at the beginning of each fattening cycle. Other important investments were in better-quality feed and the infrastructure (land and cattle pens) needed to expand the scale of production. These capital requirements encouraged almost all farmers to take credit; with only 6% relied on cattle-sharing with other farmers.

Several factors influenced access to credit by fattening households. Farmers with larger landholdings had better access to credit because the land could be used as security and it provided scope to increase the scale of production. Farmers whose primary occupation was in non-farm employment also had better access to credit because they have regular or alternative income to repay the loan. Participation in a farmers' group was important, enabling members to work together to apply for loans and grants, learn technology, and reduce the transaction costs involved borrowing and marketing. Farmers with more cattle and diversified operations (incorporating both breeding and fattening) had better access to bank credit, while farmers' education and the type of cattle pens had no significant influence on credit access.

A cashflow analysis based on survey data indicated that cattle fattening conducted by small-medium farmers was profitable, thus providing an incentive for banks to provide credit. The availability of credit enabled small farmers to increase slightly the number of cattle kept, which also increased their profit relative to small farmers without credit. However, for medium farmers, even though the use of credit affected their scale of production, they generated less profit than medium farmers without credit, reflecting inefficient use of credit and production inputs. According to the sensitivity analysis, cattle fattening was feasible under both subsidised credit and commercial credit with interest rates of 13-15%. The feasibility, however, was dependent on several conditions such as the price of cattle, the weighing system used, and support in the form of technical assistance (such as cattle training, animal health etc.) and guarantors to underwrite loans.

10.3. *What are the determinants of the supply of finance from banks for household cattle fattening?*

The supply of finance for household cattle fattening was shown in Chapter 6 to be determined by the source of finance, the structure of the lending institution, the loan product and arrangements, and the incentives for the bank to provide loans for cattle

fattening. While it is widely perceived that informal finance is important in agricultural production, most finance for cattle fattening in Tuban (91% of farmers) and Lamongan (97% of farmers) was formal finance from banks, government agencies, and private companies. Of this, subsidised credit with a low interest rate under the Food Security and Energy Credit (KKPE) or the Business Credit (KUR) program was a substantial source of finance. Few farmers in the study sites were involved in informal profit-sharing arrangements for cattle fattening.

Bank lending for agriculture was only around 11% of their portfolio and even less for cattle fattening. Bank credit for cattle fattening included government-subsidised credit (KKPE, KUR, and Credit for Quality Improvement and Intensification of Cattle Production (PMI)) and lines of credit established by the banks with a commercial interest rate (Food Credit, Productive Credit “Pundi Kencana” from Bank Jatim, Food Security Credit “Simas Agri” from Bank Sinarmas). Different bank structures resulted in different limits to the total credit disbursed to farmers. At the branch level, there was generally a low credit limit for cattle fattening, compared to the central or regional office level. However, this varied by region. Some local branches could lend large amounts if cattle fattening was a major business in the area or had high potential.

The quota of KKPE credit for livestock in Indonesia during 2012-2015 as a whole was about 29%, while the rest were for sugarcane, food crops, and horticulture sub sector, and only 48% of that quota for livestock could be distributed for farmers. In East Java, only 12% of the total quota for livestock could be accessed by farmers. However, the percentage of KKPE credit used for livestock in the study areas was up to twice the quota. For KUR credit, the national allocation for all sectors was IDR 100-120 trillion in 2016, of which about IDR 94.4 trillion was successfully disbursed. In the study areas, the disbursement of this form of credit exceeded 100%. Hence banks provided their regular borrowers with their own loan products as mentioned above. In the case of Lamongan District, due to the limited amount of PMI credit (IDR 2.2 billion per year), banks could not meet the demand, which was estimated to be about IDR 4-5 billion per year.

Even administering loans with subsidised interest rates reduced bank profits due to the high cost of selecting credit-worthy borrowers, the lower service fee charged to farmers, and the crowding out of commercial lending by program credit. However, program credit benefited the banks by helping retain their customers and attracting new borrowers. It also expanded their loan portfolio by including cattle fattening. There was no difference between subsidised and commercial loans in terms of the criteria applied and the loan assessment process, except that recommendation letters were required from livestock

agencies for the subsidised loans. Banks also used the “Five C” criteria (character, capacity, capital, condition, and collateral) to select their borrowers.

However, there were other aspects considered by bank officers in the study areas. For instance, banks loaned more to farmers who were involved in groups (to reduce transaction costs); who engaged with agribusiness (linking them to input and product markets); accessed technical support from livestock agencies; were recommended by a large producer or company; and whose budget analysis showed the expected profit that gave the bank the confidence to invest.

10.4. *What is the role of intermediate actors and services in facilitating the viable flow of credit from banks to cattle fattening households?*

As outlined in Chapter 7, there were five actors involved in the different financing models observed in the study areas – government offices, technical research agencies, agribusiness, farmers’ groups, and private companies. The Central Government established credit programs that supported investment in cattle fattening. Local Government (Livestock Services Agencies, and Executive Agency for Extension and Food Security) communicated with farmers about the programs, provided them with technical services, and connected them with other actors such as banks and research institutions. However, Local Government officials were less involved in organising commercial loans. In turn, village officials were required to provide documents for all kinds of loans as this is a standard procedure with loan applications.

The second type of actor was the technical research agencies (Government research institutions and Universities). These agencies provided their expertise and extended technology to farmers. They also assisted in strengthening the institutional arrangements for livestock financing. Government research institutions usually worked together with the Livestock Services Agencies to support subsidised credit programs, while Universities collaborated especially with private companies and banks.

The third type of actor was agribusinesses such as integrated beef cattle companies, feed mills, and commercial traders who provided key inputs (feed and feeder cattle) and bought finished cattle. These agribusinesses could play an important role in connecting farmers with lending institutions and providing loan guarantees.

The fourth category of actor comprised of the farmers’ groups and cooperatives that helped farmers to process and manage loans and conduct the cattle-fattening business by sharing costs, supplying inputs, and facilitating the sale of finished cattle. However, some farmers’ groups had recently formed merely to qualify for a Government subsidy.

Finally, some large, non-agricultural companies linked with farmers through their corporate social responsibility (CSR) programs. They could lend to farmers at low interest rates, provide them with technical assistance and training, and connect them with related actors such as banks, input suppliers, and buyers. However, the role of this kind of actor was limited to the areas in which they were operating and to those companies that decided to target cattle production.

10.5. *What is the structure and performance of different types of "finance for cattle fattening" schemes?*

The roles of the above five actors were examined in the context of six different types of "financing for fattening" scheme, as described in Chapter 8. The characteristics used to categorise the schemes included the borrowers (individual vs group), the type of credit, the source of the loan, the type of intermediaries or guarantors linking farmers with lenders, and the type of loan arrangement. While some Schemes (1, 2, and 3) required recommendation letters from the Government (for KKPE, KUR, PMI), other Schemes (2, 4, 5, and 6) required links with agribusiness.

Cattle fattening was profitable in all schemes if measured in terms of net cashflow. However, in Schemes 1, 3 and 5, profitability would decrease by 10-57% if interest rate subsidies were removed, or by 91-164% if there was a delay in receiving the loan, or if there was a high cost of constructing pens or a lower than expected price of finished cattle. Schemes 2, 4, and 6 were more profitable because farmers were supported by training from livestock agencies, research institutions, or companies, had better links with agribusiness (input suppliers and buyers), and had lower production costs due to sharing costs with a group.

Schemes 1 and 3 were funded by subsidised credit, with an interest rate of 6%. However, credit was limited to larger, better-off farmers (in Scheme 1) and disbursed to the same farmers every year (in Scheme 3) who might use the credit for other purposes than cattle fattening which were not aligned with the Government program. These Schemes were high risk due to poor access to input suppliers and buyers, as well as mis-timing of the loans relative to the cattle fattening cycle.

Scheme 2 was also funded by subsidised credit, but at a higher interest rate (9%). The formation of groups helped members access and manage loans. This reduced the misuse of loans and poor rates of repayment. The groups also supported farmers' businesses by facilitating marketing and reducing transaction costs, as well as linking farmers with beef cattle producers to reduce the risk of failure.

Scheme 4 was funded by a company's CSR fund through cooperatives, with a 10% interest rate. Access was limited to farmers involved in the cooperative, which helped members manage the loans, ensured that loans were used for cattle, and helped farmers by reducing the transaction costs of purchasing inputs and selling finished cattle.

Scheme 5 was funded by a bank but subsidised by a company's CSR program, reducing the cost of interest, feed transport, and pen construction. The number of farmers who could access the credit was limited by the total amount of the subsidy. However, this scheme was low risk for the bank because the company guaranteed the borrowers. Loans were also managed by input suppliers, which reduced the misuse of loans for purposes other than cattle fattening. Nevertheless, the scheme was considered unsustainable because the funding depended on the continuation of the CSR program

Scheme 6, which was established by a bank and funded by a Government credit program, was considered more sustainable. There was less risk with this scheme due to support from the livestock agency, research institutions, and companies to develop the fattening business, support from input suppliers to manage the loans; and reduced transaction costs due to working in a group.

10.6. *What measures/recommendations can improve the performance of different financial options for cattle fattening?*

A comparison between the six schemes was presented in Chapter 9 to identify measures to improve scheme performance. The first criterion considered was sustainability. As mentioned, farmers in Schemes 1, 3, and 5 had taken out loans subsidised by the Government or a company, while the loan was sourced through a CSR program in Scheme 4. This raises the question whether the schemes will be viable in the future when subsidies and programs are withdrawn. However, the budget analysis showed that cattle fattening was profitable under commercial interest rates (up to 13%). There would also appear to be benefits from diverting government funding away from subsidising interest rates to support other activities, especially technical assistance or training that could be provided to a greater number and range of farmers. This recommendation aligns with that of (Srinivas & Sitorus 2004) who suggests that farmers should rely on formal finance from banks as they are part of the whole Indonesian financial sector and have the greatest potential to increase business activity at market rates.

With regard to the accessibility of credit, the number of farmers with access to loans was limited farmers in Schemes 1, 3, 4, and 5. Those farmers who could access the credit were better-off farmers. To increase the availability of credit for a wider range of farmers,

four recommendations can be considered. First, assistance with loan preparation is very important and could be facilitated by farmers' groups, village leaders, or extension and livestock officers. Second, the government could put more into the promotion of credit programs to improve understanding of the role of credit, as well as promoting other programs such as the distribution of feed concentrates. Third, research institutions could provide more support in budgeting analyses to enable banks to better assess the profitability of investment proposals. Fourth, banks could link farmers with agribusiness and consider their recommendations as part of the assessment process.

In Schemes 1 and 3, which involved subsidised credit from the Government, there was a high incidence of misuse of loans for activities other than cattle fattening. This was not aligned with the intent of the credit program, which was to promote cattle production and national self-sufficiency in beef. Reducing this activity would require intensive monitoring from livestock services agencies and banks, but this would increase the transaction costs of the credit and erode the benefits of the subsidy. Farmers' groups have been found both in theory and practice to be a better means to monitor the use of loans by farmers (Stiglitz 1990; Upton 1996).

Farmers in Schemes 1 and 3 faced high risk due to uncertain markets for cattle inputs and outputs, leading to delays in starting their cattle-fattening operation. It is suggested that farmers should enter into contracts with agribusiness to determine the price for cattle. Risks could also be reduced through establishing better links with research institutions and actively connecting with Government livestock agencies to obtain technical assistance and enhance their capabilities in cattle fattening operation and marketing, as in Schemes 2 and 6.

The final recommendation is related to the number of beneficiaries of the cattle-fattening loans. Considering all the schemes in the study sites, Schemes 2 and 6 seemed to provide more benefits to more farmers. This was due to the effectiveness of the farmers' group in processing, managing, and monitoring loans, reducing the transaction costs of lenders and this enabling a greater flow of finance. Hence the strategy of forming farmers' groups to support cattle fattening households should be viewed as an essential component of any institutional arrangement to link credit demand and supply.

10.7. Summing up and recommendations for further research

In summary, capital has an important role to play in small-holder cattle fattening, both for investment in assets and in financing operating costs. Banks would seem to have an incentive to lend for cattle fattening, which can be a profitable investment with both

subsidised and non-subsidised interest rates. However, to supply credit to farmers more efficiently, there needs to be an effective farmers' group or cooperative to help farmers in managing their loans (from the loan application process to the correct utilisation of the loan, to monitoring repayments) and in conducting their cattle-fattening business (through sharing knowledge and production costs and organising marketing of feeder and finished cattle). Groups can also reduce loan transaction costs for banks, thereby increasing their capacity to provide finance. Support from agribusiness can also be important to support farmers' loan applications and increase certainty in cattle marketing. Likewise, support from technical and research institutions is important in providing technical advice and financial appraisals, helping reduce the risks for farmers and lenders. In terms of existing models in the study sites, it seems that Schemes 2 and 6 score well on most criteria and have potential to be applied in other cattle-producing regions of Indonesia. However, the costs of support for Scheme 6 may be high and need to be balanced against the benefits in each context.

This research has used in-depth empirical case-studies consisting of six different financing models for cattle fattening in two sites in East Java to answer the research questions. However, there is an opportunity for future research to test the application of the recommended model in different locations. The study has also not considered the cost of support given by third-party agencies, which would help in assessing the efficacy of such support and the sustainability of the schemes. Therefore, the analysis of additional cost should be important in future research.

The study found that most of the finance for cattle fattening was provided by the formal financial market, and most of this was subsidised credit. Theoretically, subsidised credit crowds out commercial credit. Nevertheless, banks were still involved in these programs and yet developed their own credit programs at commercial rates. Further research is required to determine the impact of credit programs on the sustainability of commercial credit.

REFERENCES

Abdullah, M 2010, 'The role of rice straw as a feed for sustainable beef cattle production in East Java Province, Indonesia', *Advances in Animal Biosciences*, vol. 1, no. 2, pp. 473-4.

Abedullah, Mahmood, N, Khalid, M & Kouser, S 2009, 'The role of agricultural credit in the growth of livestock sector: A case study of Faisalabad', *Pakistan Veterinary Journal*, vol. 29, no. 2, pp. 81-4.

Abula, M, Otitolaiye, JO, Ibitoye, SJ & Orebiyi, JS 2013, 'Repayment performance of rural farmers loan beneficiaries of microfinance banks in Kogi State, Nigeria (2005 – 2010)', *International Journal of Farming and Allied Sciences*, vol. 2, no. 5, pp. 104-10.

Adam, DW, Graham, DH & Pischke, JDV 1984, *Undermining rural development with cheap credit*, Westview Press, Boulder, Colo.

Adams, DW & Pischke, JDV 1992, 'Microenterprise credit programs: déjàVu', *World Development*, vol. 20, no. 10, pp. 1463-70.

Adinata, KI, Sari, AI & Rahayu, ET 2012, 'Development strategy of beef cattle business at Mojolaban subdistrict of Sukoharjo Regency', *Tropical Animal Husbandry*, vol. 1, no. 1, pp. 24-32.

Adiwinarti, R, Lestari, CMS, Purbowati, E, Rianto, E & Arifin, M 2014, 'The productivity of Java Bulls fed rice straw, rice bran and gliricidia leaves and minerals', in *Proceedings of The 16th AAAP Animal Science Congress*, Gadjah Mada University, Yogyakarta, Indonesia, vol. II, pp. 2287-90.

Affandhy, L, Anderson, S, Andrayani, D, Antari, R, Cahyadi, F, Cahyono, DB, Dahlanuddin, Dikman, D, Fordyce, G, Gunadi, S, Hanifah, V, Haryanto, B, Hidayat, M, Indrakusuma, DA, Irawan, F, Ismi Jazila, K, Mahendri, IGAP, Marsetyo, Ningrum, GP, Pamungkas, D, Panjaitan, T, Prasetia, E, Rahman, Ratnawati, D, Romadhon, S, Rusman, M, Saili, T, Sukarta, IK, Suminah, Syahniar, TM, Tambunan, R & Wahyudi, T 2016, *Improving the reproductive performance of cows and performance of fattening cattle in low input systems of Indonesia and Northern Australia*, ACIAR, Canberra, Australia.

Affandhy, L, Ratnawati, D, Dikman, DM, Wahyudi, T, Cahyono, DB, Romadhon, S, Mayberry, DE & Poppi, DP 2014, 'Reproductive performance and body condition score of Crossbred Ongole (*Bos indicus*) cows used for draught in East Java, Indonesia', in *Proceedings of the 16th AAAP Animal Science Congress*, Gadjah Mada University, Yogyakarta, Indonesia, vol. II, pp. 1406-9.

Ammani, AA 2012, 'An investigation into the relationship between agricultural production and formal credit supply in Nigeria', *International Journal of Agriculture and Forestry*, vol. 2, no. 1, pp. 46-52.

Aryandrie, DF, Santosa, PE & Suharyatib, S 2015, 'Tingkat infestasi cacing hati pada sapi Bali di Kecamatan Sukoharjo Kabupaten Pringsewu Propinsi Lampung', *Jurnal Ilmiah Peternakan Terpadu*, vol. 3, no. 3, pp. 134-9.

Ashari 2009, 'Optimalisasi kebijakan kredit program sektor pertanian di Indonesia', *Analisis Kebijakan Pertanian*, vol. 7, no. 1, pp. 21-42.

Badan Pusat Statistik 2013, *The agricultural census 2013*, Badan Pusat Statistik, viewed 12 December 2014, <http://st2013.bps.go.id/dev2/index.php/site/topik?kid=5&kategori=Peternakan.>.

Badan Pusat Statistik 2016, *Garis kemiskinan menurut provinsi, 2013 - 2018*, Badan Pusat Statistik, viewed 17 December 2018, <https://www.bps.go.id/dynamictable/2016/01/18/1120/garis-kemiskinan-menurut-provinsi-2013---2018.html>.

Badan Pusat Statistik 2017, *Outstanding of micro, small and medium enterprises (MSMEs) credits of commercial banks (billion rupiahs), 2012-2016*, Badan Pusat Statistik, viewed 22 March 2018, <https://www.bps.go.id/statictable/2015/09/30/1876/posisi-kredit-usaha-mikro-kecil-dan-menengah-umkm-1-pada-bank-umum-miliar-rupiah-2012-2016.html; https://www.bps.go.id/dynamictable/2015/12/22/1072/posisi-kredit-modal-kerja-perbankan-menurut-sektor-ekonomi-2010-2017-miliar-rupiah-.html>.

Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian 2016a, *Atlas peta tanah semi detail skala 1:50.000 Kabupaten Lamongan Propinsi Jawa Timur*, Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian, Badan Penelitian dan Pengembangan Pertanian, Bogor, Indonesia.

Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian 2016b, *Atlas peta tanah semi detail skala 1:50.000 Kabupaten Tuban Propinsi Jawa Timur*, Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian, Badan Penelitian dan Pengembangan Pertanian, Bogor, Indonesia.

Bank Indonesia 2013a, *Laporan keuangan publikasi Bank Perkreditan Rakyat Konvensional*, Bank Indonesia, viewed 20 Desember 2017, <http://www.bi.go.id/id/publikasi/laporan-keuangan/bank/bpr-konvensional/Default.aspx>.

Bank Indonesia 2013b, *Pola pembiayaan usaha kecil menengah: usaha budidaya penggemukan sapi potong*, Bank Indonesia, Jakarta, Indonesia.

Bank Jatim 2016, *Annual report PT Bank Pembangunan Daerah Jawa Timur* PT Bank Pembangunan Daerah Jawa Timur Tbk, Jawa Timur, Indonesia.

Bank Mandiri 2016, *Annual report PT Bank Mandiri (Persero) Tbk. 2016*, PT Bank Mandiri (Persero) Tbk., Jakarta.

Ben 2013, *Swasembada daging 2014 dipastikan gagal, Profesor ini usulkan 5 jurus*, Jaringnews.com, viewed 10 June 2014, <http://103.7.228.234/ekonomi/sektor-riil/49273/swasembada-daging-dipastikan-gagal-profesor-ini-usulkan-jurus>.

Besley, TJ 1998, 'How do market failures justify interventions in rural credit markets?', in CK Eicher & JM Staatz (eds), *International agricultural development*, Third edn, The Johns Hopkins University Press, Baltimore and London, pp. 370-89.

BNI 2016, *Annual report BNI 2016*, PT Bank Negara Indonesia, Jakarta, Indonesia.

BPS Jawa Timur 2015, *Jawa Timur dalam Angka 2015*, Badan Pusat Statistik Propinsi Jawa Timur, Jawa Timur.

Braverman, A & Guasch, JL 1986, 'Rural credit markets and institutions in developing countries: lesson for policy analysis from practice and modern theory', *World Development*, vol. 14, no. 10/11, pp. 1253-67.

BRI, B 2016, *Annual report Bank BRI 2016*, PT BRI, Jakarta, Indonesia.

Budastra, IK 2003, 'Rural financial institutions and households in Indonesia after liberalisation', Phd thesis, The University of Queensland.

Buttari, JJ 1995, 'Subsidized credit programs: the theory, the record, the alternatives', *USAID Evaluation Special Study*, vol. 75.

Cahyadi, F, Priyanti, A, Mahendri, I-GAP & Cramb, RA 2012, 'Inventory analysis of smallholder beef cattle in East Java', in *Proceedings of International Conference on Livestock Production and Veterinary Technology 2012*, Bogor, West Java, Indonesia, pp. 342-51.

Christen, R, Rhyne, E & Vogel, R 1995, *Maximizing the outreach of microenterprise finance: an analysis of successful microfinance programs*, USAID, Washington, DC.

Ciaian, P, Pokrivcak, J & Szegenyova, K 2012, 'Do agricultural subsidies crowd out or stimulate rural credit market institutions? The case of EU Common Agricultural Policy*', *European Integration online Papers (EIoP)*, vol. 16, no. 15, pp. 1-30.

Corbett, J 1987, 'International perspectives on financing: evidence from Japan', *Oxford Review of Economic Policy*, vol. 3, no. 4, pp. 30-55.

Creswell, JW 2009, *Research design: qualitative, quantitative and mixed methods approaches*, SAGE Publications, The United States of America.

Dahri, Hutagaol, P, Siregar, H & Simatupang, P 2015, 'Dampak kredit program KKPE dalam pengembangan usaha ternak sapi di tingkat peternak di Jawa Tengah', *Jurnal Manajemen & Agribusiness*, vol. 12, no. 2, pp. 115-25.

deRosari, BB, Sinaga, BM, Kusnadi, N & Sawit, MH 2014, 'Input demand and cattle production in East Nusa Tenggara Province, Indonesia', *Global Journal of Commerce & Management Perspective*, vol. 3, no. 4, pp. 1-7.

DFAT 2015, *Strengthening agricultural finance in rural areas (SAFIRA)*, Department of Foreign Affairs and Trade, Indonesia.

DFAT 2017, *Australian Indonesia Partnership for promoting rural incomes through support for markets in agriculture (AIP PRISMA-2)*, Department of Foreign Affairs and Trade, Indonesia.

Diagne, A & Zeller, M 2001, *Access to credit and its impact on welfare in Malawi*, International Food Policy Research Institute, Washington DC.

Dinas Peternakan Propinsi Jawa Timur 2014, *Rencana strategis Dinas Peternakan Propinsi Jawa Timur 2014-2019*, Dinas Peternakan Propinsi Jawa Timur, Jawa Timur.

Directorate General of Livestock and Animal Health Services 2013, *Livestock and animal health statistic*, Directorate General of Livestock and Animal Health Services, Ministry of Agriculture, Indonesia.

Directorate General of Livestock and Animal Health Services 2017, *Livestock and animal health statistics 2017*, Directorate General of Livestock and Animal Health Services, Ministry of Agriculture, Jakarta, Indonesia.

Direktorat Jenderal Peternakan dan Kesehatan Hewan 2011, *Pedoman pelaksanaan Sarjana Membangun Desa (SMD) tahun 2011*, Direktorat Jenderal Peternakan dan Kesehatan Hewan, Jakarta.

Direktorat Jenderal Peternakan dan Kesehatan Hewan 2014, 'Evaluasi kinerja kredit usaha pembibitan sapi (KUPS) dan keberlanjutannya', paper presented to Pertemuan evaluasi kredit usaha pembibitan sapi (KUPS), Direktorat Jenderal Peternakan dan Kesehatan Hewan. Bogor, Indonesia, 22 Oktober 2014.

Direktorat Pembiayaan Pertanian 2014a, *Pedoman teknis kredit ketahanan pangan dan energi (KKPE)*, Direktorat Pembiayaan Pertanian, Direktorat Jenderal Prasarana dan Sarana Pertanian, Kementerian Pertanian, Jakarta, Indonesia.

Direktorat Pembiayaan Pertanian 2014b, *Realisasi KKPE per bank pelaksana*, Direktorat Pembiayaan Pertanian, Direktorat Jenderal Prasarana dan Sarana Pertanian, Jakarta, Indonesia.

Djajanegara, A & Diwyanto, K 2001, 'Development strategies for genetic evaluation of beef production in Indonesia', in *Proceedings of ACIAR Workshop*, Khon Kaen Province, Thailand, vol. 108, pp. 40-7.

Ellis, F 1992, *Agricultural policies in developing countries*, First edn, Cambridge University Press, Australia.

Elly, FH, Sinaga, BM, Kuntjoro, SU & Kusnadi, N 2008, 'Pengembangan usaha ternak sapi rakyat melalui integrasi sapi-tanaman di Sulawesi Utara', *Jurnal Litbang Pertanian*, vol. 27, no. 2, pp. 63-8.

Etonihu, KI, Rahman, SA & Usman, S 2013, 'Determinants of access to agricultural credit among crop farmers in a farming community of Nasarawa State, Nigeria', *Journal of Development and Agricultural Economics*, vol. 5, no. 5, pp. 192-6.

Fauzi, AS & Djajanegara, A 2004, 'Kajian pemasaran sapi potong dalam pengembangan sistem integrasi tanaman-ternak', in *Prosiding Sistem Integrasi Tanaman-Ternak* Bali, Indonesia, pp. 554-69.

Freixas, X & Rochet, J-C 2008, *Microeconomics of banking*, Second edn, The MIT Press Cambridge, Massachusetts, London, England.

Furubotn, EG & Richter, R 2005, *Institutions and economic theory: the contribution of the new institutional economics (economics, cognition, and society)*, Second edn, University of Michigan Press, Michigan, United States.

Gonzales-Vega, C 1984, 'Credit rationing behavior of agricultural lenders: the iron law of interest rate restrictions', in DW Adam, DH Graham & JDV Pischke (eds), *Undermining Rural Development with Cheap Credit*, Westview Press, Boulder, Colo.

Hadi, PU & Ilham, N 2000, 'Peluang pengembangan usaha pembibitan ternak sapi potong di Indonesia dalam rangka swasembada daging 2005.', paper presented to Pertemuan Teknis Penyediaan Bibit Nasional dan Revitalisasi UPT Jakarta, 11−12 Juli 2000.

Hadi, PU & Ilham, N 2002, 'Problem dan prospek pengembangan usaha sapi potong di Indonesia', *Jurnal Litbang Pertanian*, vol. 21, no. 4, pp. 148-57.

Hadi, PU, Ilham, N, Thahar, A, Winarso, B, Vincent, D & Quirke, D 2002, *Improving Indonesia's beef industry*, ACIAR Monograph Series No 95, Canberra, Australia.

Hanifah, VW, Priyanti, A, Mahendri, IGAP, Cahyadi, F & Cramb, R 2010a, 'Characterization of beef cattle production system in East Java: small producers', paper presented to First Annual Meeting LPS Project No 2008/038, Mataram, West Nusa Tenggara, Indonesia, 21-24 October 2010.

Hanifah, VW, Priyanti, A, Mahendri, IGAP & Cramb, RA 2010b, 'A comparison of feeding management practices of beef cattle smallholders in lowland and upland sites in East Java', in *Proceedings of The 5th International Seminar on Tropical Animal Production Community Empowerment and Tropical Animal Industry*, Yogyakarta, Indonesia, pp. 189-95.

Hardaker, JB, Huime, RBM & J.R. Anderson, JR 1997, *Coping with risk in agriculture*, CAB International, Wallingford, Wallingford, Oxfordshire, England.

Harrel Jr, FE 2001, *Regression modeling strategies with applications to linear models, logistic regression and survival analysis*, Springer-Verlag, New York, New York.

Hartono, B & Rohaeni, ES 2014, 'Contribution to income of traditional beef cattle farmer households in Tanah Laut Regency, South Kalimantan, Indonesia', *Livestock Research for Rural Development*, vol. 26, no. 8, viewed 8 July 2014, <http://www.lrrd.org/lrrd26/8/hart26141.htm>.

Hastuti, EL & Supadi 2004, 'Aksessibilitas masyarakat terhadap kelembagaan pembiayaan pertanian di Pedesaan', *ICASERD Working Paper*, vol. 57, pp. 1-15, viewed 9 July 2014, <http://www.academia.edu/7624511/AKSESIBILITAS_MASYARAKAT_TERHADAP_KELEMBAGAAN_PEMBIAYAAN_PERTANIAN_DI_PEDESAAN>.

Hedrick, TE, Bickman, L & Rog, DJ 1993, *Applied research design: the nature of applied research*, SAGE Publications, Inc., Thousand Oaks, California.

Hermawan, H & Andrianyta, H 2012, 'Lembaga keuangan mikro agribisnis: terobosan penguatan kelembagaan dan pembiayaan pertanian di perdesaan', *Analisis Kebijakan Pertanian*, vol. 10, no. 2, pp. 143-58.

Herrero, M, Grace, D, Njuki, J, Johnson, N, Enahoro, D, Silvestri, S & Rufino, MC 2013, 'The roles of livestock in developing countries', *Animal*, vol. 7, no. 1, pp. 3-18.

Herrero, M, Thornton, PK, Gerber, P & Reid, RS 2009, 'Livestock, livelihoods and the environtment: understanding the trade-offs', *Current Opinion in Environmental Sustainability*, vol. 1, no. 2, pp. 111-20.

Hoff, K, Braverman, A & Stiglitz, JE 1993, 'Introduction', in K Hoff, A Braverman & JE Stiglitz (eds), *The economics of rural organization: theory, practice, and policy*
Oxford University Press, Oxford, pp. 1-29.

Huda, S & Wikanta, W 2017, 'Pemanfaatan limbah kotoran sapi menjadi pupuk organik sebagai upaya mendukung usaha peternakan sapi potong di kelompok tani ternak Mandiri Jaya Desa Moropelang Kec. Babat Kab. Lamongan', *Aksiologiya: Jurnal Pengabdian Kepada Masyarakat*, vol. 1, no. 1, pp. 26-35.

Huirne, RBM, Meuwissen, MPM, Hardaker, JB & Anderson, JR 2000, 'Risk and risk management in agriculture: an overview and empirical results', *International Journal of Risk Assessment and Management*, vol. 1, no. 1/2, pp. 125-36.

Huppi, M & Feder, G 1990, 'The role of groups and credit cooperatives in rural lending', *The World Bank Research Observer*, vol. 5, no. 2, pp. 187-204.

Ilham, N 2009, 'Kebijakan pengendalian harga daging sapi nasional', *Analisis Kebijakan Pertanian*, vol. 7, no. 3, pp. 211-21.

Isyanto, AY, Semaoen, MI, Hanani, N & Syafrial 2013, 'Measurement of farm level efficiency of beef cattle fattening in West Java Province, Indonesia', *Journal of Economics and Sustainable Development*, vol. 4, no. 10, pp. 100-4.

Jafee, D & Russell, T 1976, 'Imperfect information, uncertainty and credit rationing', *Quarterly Journal of Economics*, vol. 90, no. 4, pp. 651-66.

Kadir, TN 2009, 'Program sapi berlian Propinsi Jawa Timur', paper presented to Seminar Tematik dalam rangka Hari Ulang Tahun "Indonesia Keluar dari Perangkap Impor Sapi Potong". Badan Penelitian dan Pengembangan Pertanian yang ke-35., Bogor, 12 Agustus 2009.

Kalangi, LS, Syaukat, Y, Kuntjoro, SU & Priyanti, A 2014, 'The characteristics of cattle farmer households and the income of cattle farming businesses in East Java', *IOSR Journal of Agriculture and Veterinary Science*, vol. 7, no. 12, pp. 29-34.

Karlan, D, Osei, RD, Osei-Akoto, I & Udry, C 2012, 'Agricultural decisions after relaxing credit and risk constraints', *WORKING PAPER*, vol. 18463, pp. 1-64.

Kementerian Keuangan 2014, 'Kebijakan pemerintah terhadap pengembangan skim KUPS (2010 s.d 2014)', paper presented to Pertemuan evaluasi kredit usaha pembibitan sapi (KUPS), Bogor, Indonesia, 22 Oktober 2014

Kementerian Koordinator Bidang Perekonomian 2018a, *Kebijakan KUR*, Sekretaris Tim Teknis Komite Kebijakan Pembiayaan Bagi UMKM (KUR), viewed 19 December 2018, <http://kur.ekon.go.id/kebijakan-kur>.

Kementerian Koordinator Bidang Perekonomian 2018b, *Kumpulan peraturan kredit usaha rakyat (KUR)*, Kementerian Koordinator Bidang Perekonomian, Jakarta.

Kementerian Pertanian 2015, *Rencana strategis Kementerian Pertanian tahun 2015-2019*, Kementerian Pertanian, Jakarta.

Kementerian Pertanian 2016, *Outlook daging sapi komoditas pertanian subsektor peternakan*, Pusat Data dan Sistem Informasi Pertanian Sekretariat Jenderal, Kementerian Pertanian, Jakarta.

Khan, MA & Rahaman, MA 2007, 'Impact of microfinance on living standards, empowerment and poverty alleviation of poor: a case study on microfinance in the Chittagong district of Bangladesh', Master thesis, Umea School of Business, Sweden.

Koesmara, H, Nurtini, S & Budisatria, IGS 2015, 'Factors effected of marketing margin on cattle and beef cattle in Aceh Besar Regency', *Buletin Peternakan*, vol. 39, no. 1, pp. 57-63.

Kusuma, H 2017, *Realisasi KUR 2016 capai Rp 94,4 T, setengahnya di Jawa*, Detik Finance, viewed 14 March 2018, <https://finance.detik.com/moneter/3417776/realisasi-kur-2016-capai-rp-944-t-setengahnya-di-jawa>.

Lisson, S, MacLeod, N, McDonald, C, Corfield, J, Pengelly, B, Wirajaswadi, L, Rahman, R, Bahar, S, Padjung, R, Razak, N, Puspadi, K, Dahlanuddin, Sutaryono, Y, Saenong, S, Panjaitan, T, Hadiawati, L, Ash, A & Brennan, L 2010, 'A participatory, farming systems approach to improving Bali cattle production in the smallholder crop–livestock systems of Eastern Indonesia', *Agricultural Systems*, vol. 103, no. 7, pp. 486-97.

Mahendri, IGAP 2009, 'Analisis efektivitas kredit ternak domba dan dampaknya terhadap pendapatan rumahtangga petani penerima kredit di Kabupaten Bogor', Master thesis, Institut Pertanian Bogor, Bogor, Indonesia.

Mahendri, IGAP, Priyanti, A & Cramb, R 2012, 'Characterising the marketing chain for beef cattle in East Java, Indonesia', in K S, S T, J D, B K & S P (eds), *Proceedings of The 15th Asian-Australasian Association of Animal Production Societies Animal Science Congress*, Thammasart University, Bangkok, Thailand, pp. 397-401.

Mahendri, IGAP, Priyanti, A, Hanifah, V & Cramb, R 2010, 'Marketing practices of smallholder beef cattle producers in East Java', in *Proceedings of The 5th International Seminar on Tropical Animal Production Community Empowerment and Tropical Animal Industry*, Gadjah Mada University, Yogyakarta, Indonesia, pp. 741-6.

Mahendri, IGAP, Waldron, S, Wegener, M & Cramb, RA 2016, 'A comparison of cattle fattening system with and without credit in two districts in East Java, Indonesia', in *Proceedings of The 17th Asian-Australasian Association of Animal Production Societies Animal Science Congress*, Fukuoka, Japan, pp. 197-201.

Mahendri, IGAP, Waldron, S, Wegener, M & Cramb, RA 2018, 'Factors influencing farmers uptake of credit for cattle fattening in two districts in East Java, Indonesia', in *Proceedings of the International Conference on Livestock Value Chain and Access to Credit*, Ezulwini, Swaziland, pp. 46-52.

Makeham, JP & Malcolm, LR 1986, *The economics of tropical farm management*, Cambridge University Press, New York.

Masum, K, Yusran, MA & Teleni, E 1993, *Draught animal systems and management: an Indonesian study: East Java*, ACIAR Monograph No 19, Australian Centre for International Agricultural Research, Canberra, Australia.

Mathius, IW 2008, 'Pengembangan sapi potong berbasis industri kelapa sawit', *Pengembangan Inovasi Pertanian*, vol. 1, no. 2, pp. 206-24.

Mayangsari, D, Prasetyo, E & Mukson 2014, 'Evaluasi kredit usaha peternakan sapi potong pada kelompok tani ternak', *Journal of Economics and Policy*, vol. 7, no. 1, pp. 14-21.

Mayberry, D 2014, 'Opportunities to increase smallholder beef production in Indonesia', paper presented to XXIV Congresso Brasileiro de Zootecnia, Vitória ES, Brazil, 12-14 May 2014.

Mellor, JW 1966, *The economics of agricultural development*, First edn, Cornell University Press, London, New York.

Meuwissen, MPM, Hardaker, JB, Huirne, RBM & Dijkhuizen, AA 2001, 'Sharing risks in agriculture; principles and empirical results', *Netherlands Journal of Agricultural Science*, vol. 49, pp. 343-56.

Minelli, E & Modica, S 2009, 'Credit market failures and policy', *Journal ofPublic Economic Theory*, vol. 11, no. 3, pp. 363-82.

Motsoari, C, Cloete, PC & Schalkwyk, HDv 2015, 'An analysis of factors affecting access to credit in Lesotho's smallholder agricultural sector', *Development Southern Africa*, vol. 32, no. 5, pp. 592–602.

Newbery, DM 1989, 'Agricultural Institutions for Insurance and Stabilization', in Bardham (ed.), *The economic theory of agrarian institutions*, Oxford University Press, Oxford.

Norton, GW, Alwang, J & Master, WA 2010, *Economic of agricultural development: world food systems and resources use*, Second edn, vol. 14, part 4, section 14 Input and credit markets, Routledge Press, New York.

Nurmanaf, AR 2007, 'Lembaga informal pembiayaan mikro lebih dekat dengan Petani', *Analisis Kebijakan Pertanian*, vol. 5, no. 2, pp. 99-109.

Nurmanaf, AR, Hastuti, EL, Ashari, Friyatno, S & Wiryono, B 2006, 'Analisis sistem pembiayaan mikro dalam mendukung usaha pertanian di pedesaan', paper presented to Seminar Hasil Penelitian T.A. 2006, Bogor, Indonesia.

Nuryartono, N 2007, 'Credit rationing of farm households and agricultural production: empirical evidence in the rural areas of Central Sulawesi, Indonesia', *Jurnal Manajemen Agribisnis*, vol. 4, no. 1, pp. 15-21.

OECD 2009, 'Managing Risk in Agriculture: A Holistic Approach', OECD, Paris.

Okello, WO, Muhanguzi, D, MacLeod, ET, Welburn, SC, Waiswa, C & Shaw, AP 2015, 'Contribution of draft cattle to rural livelihoods in a district of Southeastern Uganda endemic for bovine parasitic diseases: an economic evaluation', *Parasites & Vectors*, vol. 8, no. 571, pp. 1-9.

Okten, C & Osili, UO 2004, 'Social networks and credit access in Indonesia', *World Development*, vol. 32, no. 7, pp. 1225-46.

Oluwasola, O & Alimi, T 2008, 'Determinants of agricultural credit demand and supply among small-scale farmers in Nigeria', *Outlook on Agriculture*, vol. 37, no. 3, pp. 185-93.

Otoritas Jasa Keuangan 2017, *Indonesian banking statistics*, Financial Services Authority, Republic of Indonesia Bank Licensing and Banking Information Department, Jakarta, Indonesia, Agustus 2014, ISSN: 1858-4233, <http://www.ojk.go.id/id/kanal/perbankan/data-dan-statistik/statistik-perbankan-indonesia/Documents/Pages/Statistik-Perbankan-Indonesia---Desember-2017/SPI%20Desember%202017.pdf>.

Pacheco, PS, Pascoal, LL, Restle, J, Vaz, FN, Arboitte, MZ, Vaz, RZ, Santos, JPA & Oliveira, TMLd 2014, 'Risk assessment of finishing beef cattle in feedlot: slaughter weights and correlation amongst input variables', *Revista Brasileira de Zootecnia*, vol. 43, no. 2, pp. 92-9.

Padjung, R & Natsir, A 2005, *Preliminary survey on beef/Bali cattle production in South Sulawesi*, ACIAR, Canberra, Australia.

Panjaitan, T 2012, 'Performance of male Bali cattle in village system of Lombok', in *Proceedings of The 15th Asian-Australasian Association of Animal Production Societies Animal Science Congress*, Thammasart University, Bangkok, Thailand, p. 956−9.

Panjaitan, T, Fauzan, M, Dahlanuddin, Halliday, MJ & Shelton, HM 2014, 'Growth of bali bulls fattened with *Leucaena leucocephala* in Sumbawa, Eastern Indonesia', *Tropical Grasslands – Forrajes Tropicales*, vol. 2, pp. 116-8.

Pasha, R 2009, 'Analisis penawaran dan permintaan kredit serta identifikasi peluang ekspansi pembiayaan kredit sektoral di wilayah kerja KBI Malang', *Jurnal Keuangan dan Perbankan*, vol. 13, no. 1, pp. 148-64.

Patrick, IW, Graham R. Marshall, Ambarawati, IGAA & Abdurrahman, M 2010, *Social capital and cattle marketing chains in Bali and Lombok, Indonesia*, the Australian Centre for International Agricultural Research (ACIAR), Canberra, Australia.

Perdana, T 2003, *Competitiveness and comparative advantage of beef cattle fattening in Bandung Regency*, Padjadjaran University, Bandung, Indonesia.

Petrick, M 2004, *Credit rationing of polish farm households: a theoretical and empirical analysis*, vol. 26, Institut für Agrarentwicklung in Mittel-Und Osteuropa (IAMO).

Pischke, JDV 1991, *Finance at the frontier: debt capacity and the role of credit in the private economy*, World Bank, Washington DC.

Prasetyo, E, Sunarso, Santosa, PB, Rianto, E, Ekowati, T, Yuwana, DM & Mulyatno, B 2012, 'The influence of 5-C factors on rate of credit return in beef cattle farming in Central Java', *Journal of the Indonesian tropical animal agriculture*, vol. 37, no. 3, pp. 213-9.

Priyanti, A, Hanifah, VW, Mahendri, IGAP, Cahyadi, F & Cramb, RA 2012a, 'Small-scale beef cattle production in East Java, Indonesia', paper presented to the 56th AARES annual conference, Fremantle, Western Australia, 7-10 February 2012.

Priyanti, A, Mahendri, IGAP, Cahyadi, F & Cramb, RA 2012b, 'Income over feed cost for small-to medium scale beef cattle fattening operations in East Java', *Journal of the Indonesian tropical animal agriculture*, vol. 37, no. 3, pp. 195-201.

PSPK 2011, *Pendataan sapi potong, sapi perah, dan kerbau 2011 (PSPK2011)*, Badan Pusat Statistik dan Direktorat Jenderal Peternakan dan Kesehatan Hewan, Jakarta, Indonesia.

PT Bank Sinarmas 2016, *Annual report PT Bank Sinarmas Tbk. 2016*, PT Bank Sinarmas Tbk., Jakarta, Indonesia.

Ratnawati, D, Indrakusuma, DA, Affandhy, L, Cowley, F, Mayberry, D & Poppi, D 2016, 'Management strategies to improve reproductive performance of brahman cross cattle (*Bos indicus*) in East Java, Indonesia', *Jurnal Ilmu Ternak dan Veteriner*, vol. 2, no. 4, pp. 231-7.

Refita, Y 2016, 'Evaluasi efektivitas dan strategi pengembangan program Sarjana Membangun Desa', Doktor thesis, Institut Pertanian Bogor.

Robinson, MS 1998, 'Microfinance: the paradigm shift from credit delivery to sustainable financial intermediation', in CK Eicher & JM Staatz (eds), *International agricultural development*, Third edn, The Johns Hopkins University Press, Baltimore and London, pp. 390-415.

Rondong, F 2014, 'Beef sector East Java', paper presented to Australian Indonesia Partnership for Promoting Rural Income through Support for Markets in Agriculture, Sheraton Hotel, Indonesia, 10 July 2014.

Rouf, AA, Daryanto, A & Fariyanti, A 2014, 'Daya saing usaha sapi potong di Indonesia: Pendekatan domestic resources cost ', *Wartazoa*, vol. 24, no. 2, pp. 97-107.

Rozali, SM 2007, 'Microfinance for developing poor communities in East Nusa Tenggara: problems and solutions from the perspective of a non-government organisation', in S Djoeroemana, B Myers, J Russell-Smith, M Blyth & IET Salean (eds), *Proceedings of Integrated rural development in East Nusa Tenggara Barat*, East Nusa Tenggara, Indonesia, pp. 168-73.

Saleem, MA 2011, 'Sources and uses of agricultural credit by farmers in Dera Ismail Khan (District) Khyber Pakhtonkhawa Pakistan', *European Journal of Business and Management*, vol. 3, no. 3, pp. 111-21.

Serra-Garcia, M 2010, 'Moral hazard in credit markets: the incentive effect of collateral', paper presented to The Economics Workshop in Tilburg University, Netherlands, 30 October 2010.

Setyari, NPW 2012, 'Evaluasi dampak kredit mikro terhadap kesejahteraan rumah tangga di Indonesia: analisis data panel', *Jurnal Ekonomi Kuantitatif Terapan*, vol. 5, no. 2, pp. 141-50.

Silva, PHGJD & Sandika, AL 2012, 'The impact of agricultural credit and farmer trainings on small holder dairy production in Southern Region in Sri Lanka', *Iranian Journal of Applied Animal Science*, vol. 2, no. 3, pp. 265-9.

Sodiq, A & Budiono, M 2012, 'Beef cattle productivity under group of farmer at the village', *Agripet*, vol. 12, no. 1, pp. 28-33.

Sodiq, A & Yuwono, P 2016, 'Pola pengembangan dan produktivitas sapi potong program kemitraan bina lingkungan di Kabupaten Banyumas dan Cilacap Propinsi Jawa Tengah', *Agripet*, vol. 16, no. 1, pp. 56-61.

Soehadji 1995, 'Peluang usaha sapi potong dan kemitraan usaha', paper presented to Seminar Nasional Prospek Idustri Peternakan Sapi Potong di Indonesia, Bandar Lampung, Indonesia, Maret 1995.

Soeharsono, Mahendri, IGAP & Diwyanto, K 2012, 'Effect of protein supplementation on cow reproductivity performance', in *Proceedings of International Conference on Livestock Production and Veterinary Technology 2012*, Bogor, West Java, Indonesia, pp. 79-82.

Srinivas, PS & Sitorus, D 2004, 'The role of state owned banks in Indonesia', paper presented to Brookings/IMF/World Bank conference on “The Role of State-Owned Financial Institutions: Policy and Practice” the World Bank, Washington DC., 26-27 April 2004.

Stiglitz, JE 1990, 'Peer monitoring and credit markets', *World Bank Economic Review*, vol. 4, no. 3, pp. 351-66.

Stiglitz, JE & Weiss, A 1981, 'Credit rationing in markets with imperfect information', *The American Economic Review*, vol. 71, no. 3, pp. 393-410.

Stiglitz, JE & Weiss, A 1986, 'Credit rationing and collateral', in J S., S Edwards & CP Mayer (eds), *Recent developments in corporate finance*, Cambridge University Press, London.

Suardika, P, Ambarawati, IGAA & Sudarma, IM 2015, 'The effectiveness of beef cattle business partnerships on the income of livestock farmers in Timor Tengah Utara District, Nusa Tenggara Timur Province', *Jurnal Manajemen Agribisnis*, vol. 3, no. 2, pp. 155-62.

Subandriyo, I, Suparyanto, A & Inounu, I 1999, *Nucleus scheme for smallholders (PIR) in the beef cattle industry of Indonesia*, Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific, Bangkok, Thailand.

Sugiarto 2011, 'Keragaan penyaluran kredit ketahanan pangan dan energi (KKP-E) di Kabupaten Jember', *Jurnal Penelitian Pertanian Terapan*, vol. 11, no. 3, pp. 143-57.

Sugiarto & Wiryono, B 2007, 'Keragaan dan kendala pembiayaan usahatani ternak sapi', paper presented to Seminar Nasional Dinamika Pembangunan Pertanian dan Pedesaan: Mencari Alternatif Arah Pengembangan Ekonomi Rakyat, IPB International Convention Centre, Bogor, Indonesia, 4 Desember 2007.

Sugiarto, M, Djatmiko, OE & Mastuti, S 2014, 'Investment risk assessment of two types of beef cattle enterprise in Banjarnegara District, Central Java, Indonesia', in *Proceedings of the 16th AAAP Animal Science Congress Vol. II "Sustainable Livestock Production in the Perspective of Food Security, Policy, Genetic Resources and Climate Change"*, Gadjah Mada University, Yogyakarta, Indonesia, pp. 992-5.

Sukanata, IW, Suciani, Parimartha, KW, Putri, BRT & Suranjaya, IG 2014, 'Analisa pendapatan dan efisiensi ekonomis penggunaan pakan pada usahatani penggemukan sapi bali (studi kasus di Desa Lebih, Kabupaten Gianyar)', *Majalah Ilmu Peternakan*, vol. 17, no. 1, pp. 20-4.

Sumarto, S & Suryahadi, A 2000, *Penyaluran kredit bersubsidi: siapa yang menerima manfaatnya?* , SMERU Indonesia, November 2000, <http://www.smeru.or.id/newslet/2000/news11.pdf>.

Tawaf, RP, Setiadi, R & Firmansyah, C 2011, 'The role of feedlot business in beef supply chains in West Java Indonesia', *Lucrări Ştiinţifice*, vol. 55, no. Seria Zootehnie, pp. 112-6.

The World Bank 2018, *Population, total*, The World Bank Group, viewed 18 April 2018, <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=ID&view=chart>.

TNP2K 2012, *Program program penanggulangan kemiskinan*, Tim Nasional Percepatan Penanggulangan Kemiskinan, Jakarta, Indonesia.

Upton, M 1996, *The economics of tropical farming systems*, First edn, Cambridge University Press, Australia.

Vaus, Dd 2001, *Research design in social research*, SAGE Publications, London.

Waldron, S, Mayberry, D, Dahlanuddin, Mulik, M, Simon, Quigley & Poppi, D 2013, *Eastern Indonesia agribusiness development opportunities - analysis of beef value chains*, ACIAR, Canberra, Australia.

Waldron, SA 2008, 'Modernising traditional agriculture in China through the development of higher value agrifood chains: the case of the beef industry', PhD thesis, The University of Queensland, Australia.

Warriner, D 2013, *Industry engagement, relationship development and market opportunities in the Nusa Tenggara Economic Corridor*, Northern Territory Cattlement's Association Inc., Australia.

Wenner, MD 2010, 'Credit risk management in financing agriculture', *2020 Vision*, vol. Focus 18, no. Brief 10, p. 2 pp.

Widiyanti, E 2018, *KUR baru, memperluas akses pembiayaan bagi UMKM*, Sekretaris Tim Teknis Komite Kebijakan Pembiayaan Bagi UMKM (KUR), viewed 20 February 2018, <http://kur.ekon.go.id/kur-baru-memperluas-akses-pembiayaan-bagi-umkm>.

Williams, TO, Spycher, B & Okike, I 2006, *Improving livestock marketing and intra-regional trade in West Africa: determining appropriate economic incentives and policy framework*, International Livestock Research Institution, Nairobi, Kenya.

Wilson, CG & Widayanto, EB 2000, 'The bological control programme against *Chromolaena odorata* in Eastern Indonesia', in C Zachariades, R Muniappan & LW Strathie (eds), *Proceedings of The Fifth International Workshop on Biological Control and Management of Chromolaena Odorata*, Durban, South Africa, pp. 53-7.

Winarso, B 2014, 'Realisasi kegiatan program daerah dalam pengembangan pembibitan sapi potong guna mendukung swasembada daging nasional', *Jurnal Penelitian Pertanian Terapan*, vol. 14, no. 2, pp. 111-23.

Winarso, B 2015, 'Keberhasilan pengembangan ternak sapi potong melalui pola pengembangan modal usaha (KUPS)', *Jurnal Penelitian Pertanian Terapan*, vol. 15, no. 2, pp. 138-50.

Winarso, B, Sajuti, R & Muslim, C 2005, 'Tinjauan ekonomi ternak sapi potong di Jawa Timur', *Forum Penelitian Agro Ekonomi*, vol. 23, no. 1, pp. 61-71.

Winarto, PS, Leegwater, PH, Zemmelink, G & Ibrahim, MNM 2000, 'Cattle Production on small holder farms in East Java, Indonesia: I. Household and farming characteristics', *Asian-Australasian Journal of Animal Sciences*, vol. 13, no. 2, pp. 220-5.

Wooldridge, JM 2009, *Introductory econometrics, a modern approach*, 4th edn, South Western, Cengage Learning, Michigan State University, USA.

Wulandari, E, Meuwissen, MPM, Karmana, MH & Lansink, AGJMO 2017, 'Access to finance from different finance provider types: farmer knowledge of the requirements', *PLOS ONE*, vol. 12, no. 9, p. 15 pp.

Yin, RK 2003, *Case study research: design and methods*, SAGE Publications, United States of America.

Yusdja, Y & Ilham, N 2004, 'Tinjauan kebijakan pengembangan agribisnis sapi potong', *Analisis Kebijakan Pertanian*, vol. 2, no. 2, pp. 183-203.

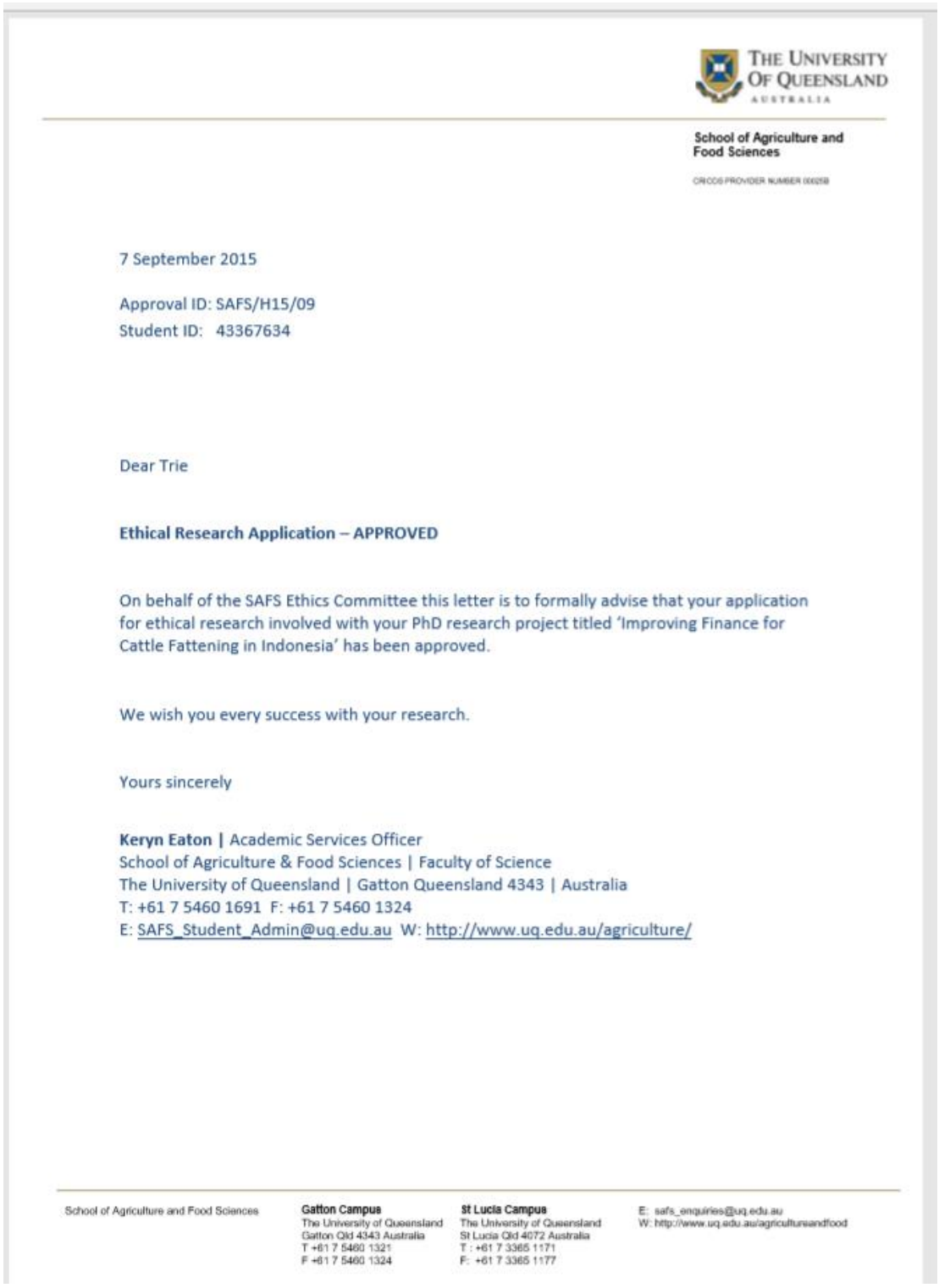
Yuwono, DM, Subiharta & Nuschati, U 2011, 'Karakteristik peternak sapi potong di lokasi Feati Desa Krinjing, Kecamatan Dukun, Kabupaten Magelang', in *Prosiding Semiloka Nasional Dukungan Agro-Inovasi untuk Pemberdayaan Petani*, Semarang, Indonesia, pp. 653-61.

Zellera, M, Diagne, A & Mataya, C 1998, 'Market access by smallholder farmers in Malawi: implications for technology adoption, agricultural productivity, and crop income', *Agricultural Economics*, vol. 19, no. 1-2, pp. 219-29.

Zulfikri, Dolorosa, E & Komariyati 2014, 'Analisis kontribusi usaha ternak sapi potong terhadap pendapatan rumah tangga petani di Kecamatan Tebas Kabupaten Sambas', *Vokasi*, vol. x, no. 1, pp. 54-67.

APPENDICES

Appendix 1. Ethical Clearance



THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

School of Agriculture and Food Sciences

CRICOS PROVIDER NUMBER 00025B

7 September 2015

Approval ID: SAFS/H15/09
Student ID: 43367634

Dear Trie

Ethical Research Application – APPROVED

On behalf of the SAFS Ethics Committee this letter is to formally advise that your application for ethical research involved with your PhD research project titled 'Improving Finance for Cattle Fattening in Indonesia' has been approved.

We wish you every success with your research.

Yours sincerely

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Appendix 2. Survey Questionnaires

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA
(CASE STUDY EAST JAVA)

(Survey)

Name : _____
Village : _____
Sub District : _____
District : _____
Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE
THE UNIVERSITY OF QUEENSLAND
2015

I. THE CHARACTERISTICS OF FARMERS

1.1. Number of Family members : ..... (including respondent)

1.2. Dependents in family (living in the same house):

Name	Relationship [1)]	Age (th)	Sex	Education (years)	Job	
					Primary	Secondary
1.	.....	.....	.....	.....	.....	.....
2.	.....	.....	.....	.....	.....	.....
3.	.....	.....	.....	.....	.....	.....
4.	.....	.....	.....	.....	.....	.....
5.	.....	.....	.....	.....	.....	.....

Note: [1)]. Relation with the respondent (husband, wife, child)

II. CHARACTERISTICS OF THE CROPPING SYSTEM

2.1. Experience in cropping system : ..... (years)

2.2. The ownership of land

Type of land	Own			Rent		Total	
	m^2	Value [2)]	Total	m^2	Value [2)]	m^2	Value [2)]
1. Rice field							
2. Dry field							
3. Yard							
4. Other land							
Total							

Note: [2)] The current value of land

2.3. Annual Cropping patterns [3)] : .....

Type of land	Land use		
	Cropping period I	Cropping period II	Cropping period III
1. Rice field			
2. Dry field			
3. Yard			
4. Others			

Note: 3) Indicate crops grown in annual cycle (12 months) which usually divided into 3 cropping periods

Cropping period I starts from ..... to .....

Cropping period II starts from ..... to .....

Cropping period III starts from ..... to .....

2.4. The farm activities and their importance:

No	Farm activities	Labour use	Cash income	Own consumption
	Cropping			
	Livestock: Cow-calf production Cattle fattening			
	Fishery			
	Feed processing			
	Others ……			

Note: Rank from 1-10 from very importance to less importance

III. CHARACTERISTICS OF CATTLE PRODUCTION SYSTEM

3.1. Experience in cattle fattening : ..... (years)
3.2. Type of production : 1) Fattening; 2) Mixed Fattening with cow-calf operation
3.3. Member of a farmers' group : Yes/No, As a leader, etc.....)
3.4. The ownership of cattle:

Age		Owner			Keeper			Total	
		Type	Total	Value (IDR)	Type	Total	Value (IDR)	Total	Value (IDR)
Adult (> 2 year)	Male								
	Female								
Young (1-2 years)	Male								
	Female								
Calves (0-1 year)	Male								
	Female								

3.5. If you are a cattle keeper:
a. Who pays production costs (pens, feed, veterinary cost, AI, transport etc.)?
Owner
Keeper
Share owner & keeper (explain) .....
b. How the profit from cattle fattening are shared between owner and keeper: .....

A. MANAGEMENT, SCALE

3.6. Reasons for keeping male cattle:
a. To grow calves until they become young adults (no specific feed)
b. Fatten cattle (commersially, with specific feed)
c. To produce bulls for breeding
d. Other .....
3.7. The number of cattle fattened:
a. The maximum capacity : ..... (How many head?)
b. Current number: ..... head
3.8. The reason why you aren't using maximum capacity:
a. It is difficult to get feeder cattle
b. The price of feeder cattle is expensive
c. Lack of infrastucture
d. Lack of feed availability
e. Limited capital
f. Others .....
3.9. The length of fattening cycles:
a. Regular ……. months; reason .....
b. Speculative time, average …… months; reason .....
3.10. Source of feeder cattle:
a. Buy from other farmers
b. Produce from own herd of cattle
c. Buy from traders (village, district, subdistrict, provinces)
d. Buy from [local?] Market

e. Other .....

3.11. The criteria that define your preferred feeder cattle:

a. Young male
b. Local .....
c. Crossbred .....
d. Good perfomance (body score, height, weight etc.)
e. Price
f. Low price, poor condition but have potential to grow quickly
g. Others .....

3.12. Why do you keep male cattle (based on criteria above):

a. Reason for preferring local cattle (PO), ……..……
b. Reason for preferring crossbred cattle, ……..……..

3.13. Decision to sell cattle is based on:

a. Reached [desired] maximum weight ……. kg
b. Based on age …… months
c. Need cash
d. No longer productive
e. Ceremony
f. Others ……..

B. Feed

3.14. Is it difficult to find feed in dry season? Yes/No

3.15. If yes, how do you deal with the problem .....

3.16. The reason why concentrate is not fed?

- The price is expensive
- Difficult to find
- Other reasons .....

3.17. How many labour units are involved in keeping fattening cattle (people/day):

Parameters	Family members		Non family members	
	Full time	Part time	Full time	Part time
The number of people Male Female Children				
Wage (IDR/day)				

C. Cattle Marketing

3.18. The price of cattle sold based on:

Weighing system ..... IDR/kg
Body weight estimation ..... IDR/head
Others: .....

3.19. Who determines the price ?

Sellers (farmers)
Buyers (traders)
Sellers and buyers

3.20. Do you regularly sell cattle to the same buyers? Yes/No

Who is the buyer ? ……
.....

3.21. Does the buyer approach the seller, or vice-versa and how does this effect price formation?

.....
.....

3.22. How many buyers do farmers have to choose from (is there a lot of completion?)

.....
.....

where does information come from (is there a lot of information?)

.....
.....

3.23. What is the role of spotters and brokers?

.....
.....

3.24. Do buyers or sellers need to aggregate lots of cattle (in more remote areas)? Yes/No
Who and how to coordinate this?

.....
.....

3.25. If there are direct sales to a feedlot or abattoir? Yes/No
Who pays the trucking, are there any holding periods and how does this effect payment terms ("spot" or delayed)?

.....
.....

3.26. The buying and selling prices received by farmers in particular season

Type of cattle		Buying price		Selling price	
		Certain market	Festival/ ceremony	Certain market	Festival/ ceremony
1. Adult	Local Male				
	Local Female				
	Crossbred male				
	Crossbred female				
2. Young	Local Male				
	Local Female				
	Crossbred male				
	Crossbred female				
3. Calves	Local Male				
	Local Female				
	Crossbred male				
	Crossbred female				

3.27. Previous marketing data (last 12 month):

No	Type of sales	Number sold	Average weight (kg)	Age (months)	Price per head (or per kg)	Type of transaction (Cash/credit)	Distance to market
1	To other farmers PO Crossbred						
2	To butcher PO Crossbred						
3	To village traders PO Crossbred						
4	To district and sub-district traders PO Crossbred						
5	Total sales PO Crossbred						

C. Budget (need to expand in excel template)

3.6. The budget for cattle fattening per period

Parameters	Total	Price (IDR)	Total Value (IDR)	Additional information
A. Cattle Production Cost				
Number of cattle kept (head)				
The amount of days in year				
Live weight bought in (kg) [4)]				
Days on feed (days)				
Live weight sold out (kg)				
Cattle sold over year (head)				
Average daily gain (kg/day)				
Cattle cost				
B. Feed Cost (from 3.7a & 3.7b)				
Grass				
Straw				
Legumes				
Concentrate				
C. Veterinary Supplements Cost				
Additives				
Salt				
Vitamin				
Vaccination/drenching				
Other medical treatment				
D. Labour Cost				

Labour for cleaning pens				
Labour for cattle fattening				
Others				
E. Pens Cost				
Capacity				
Lifespan (year)				
Construction cost Timber, nails Wire Concrete Troughs Others Person labour days				
Others				
F.. Marketing cost				
Cattle purchase cost Search/travel cost Telephone cost Broker cost				
Cattle sales cost Search/travel cost Telephone cost Broker cost				
G. Manure				
1. Production of manure				
2. Manure used for fertilizer - How much chemical could be replaced				
3..Manure used for biogas - How much gas could be replaced				
4..Manure sales				

Note: [4)] Estimate value at current price if farmers do not buy cattle from market

3.7a. Feed cost for cattle (wet season)

Type of feed	How to get feed			Amount (kg/head/day)	Price (IDR/kg)	Where (hours/km from home)
	Buy	Own land [5)]	Other farmers[5]			
Grass						
- Native Grass						
Improved grass (king, elephant etc.)						
Straw						
- Rice straw						
- Maize straw						
- Peanut straw						
- Others						
Legumes						
- Glyricidia (gamal)						
- Leucaena						

(lamtoro)						
- Sesbania (turi)						
'- Others						
Concentrate:						
- Rice bran, cassava, maize						
- Commercial concentrate						
- Others						
Total feed						

Note: 5) sometime farmers get grass/agriculture by product free from their land or public area and need to be converted to current price if farmers do not buy feed; the cost of feed includes the transportation cost (accounted).

3.7b. Feed cost for cattle (dry season)

Type of feed	**How to get feed**			**Amount (kg/head/ day)**	**Price (IDR/kg)**	**Where (hours/km from home)**
	Buy	**Own land 5)**	**Other farmers5**			
Grass						
- Native Grass						
Improved grass (king, elephant etc.)						
Straw						
- Rice straw						
- Maize straw						
- Others						
Legumes						
- Glyricidia (gamal)						
- Leucaena (lamtoro)						
- Sesbania (turi)						
'- Others						
Concentrate:						
- Rice bran, cassava, maize						
- Commercial concentrate						
- Others						
Total feed						

Note: 5) sometime farmers get grass/agriculture by product free from their land or public area and need to be converted to current price if farmers do not buy feed; the cost of feed includes the transportation cost (accounted).

IV. THE STRUCTURE OF FARMERS'INCOME

4.1. Non farm income (IDR/year):
Transfered from other family members : .....
Trading : .....
Rent (hire car, rent land, etc) : .....
Labour (Transport, construction, carpentry)
Other sources of income : .....
4.2. Off farm agricultural income (IDR/year):

Farming Worker : .....
Rent agriculture equip. (tractor, sprayer, cattle) : .....
Others : .....

V. CREDIT

5.1. Have you ever received credit from government/banks for your cattle enterprise in the past 5 years? Yes/No
Cattle distribution scheme: .....
Subsidised credit .....
Commercial credit .....

5.2. Why do you choose to accept that credit?
only know about that credit scheme
it was offered by other farmers
Lower interest rate & administration fee
Other reasons .....

5.3. If the credit is available in the form of money or cash, how do you use the money?
Buy feeder cattle
Buy feed
Build pens
Other ways .....

5.4. If you could not get credit from banks, what factors preventled you from applying?
Did not have enough information, and did not know how to apply
Farmers are not interested due to high interest rate
Application involves a complicated procedure
Need collateral
Did apply but application was not successful because .....
There is no technical support (from extension or research agencies etc)

5.5. If you could not get credit from government, what factors preventled you from applying?
Did not have enough information, and did not know how to apply
Application involves a complicated procedure
Need endorsement from Livestock Services Institution
Did apply but application was not successful because .....

5.6. Do you think that credit was necessary to support your fattening operation? Yes/No
.....

5.7. How did you eventually find the credit you needed?
a. The amount of credit is enough to fund part of inputs
b. The period of time is suitable for cattle fattening
c. Simple procedure
d. Could use the business itself as collateral
e. Others ……..……..……...

5.8. Are there any problems in accessing formal credit?
a. No problem
b. Need collateral

c. High administration fee
d. Takes a long time
e. Other reasons .....

5.9. Are there any problems in paying back borrowed money?
a. I have always re-paid my loans on time
b. I can't repay the loan because from my bussiness is not profitable
c. Other problems .....

5.10. Have you ever got credit for your catttle business from informal sources such as neighbours, moneylenders, or other agribusiness actors (traders, butcher etc.) ? Yes/No
.....

5.11. How did you get those credit?
a. Criteria
.....
.....
Procedures
.....
.....
Repayment
.....
.....

5.12. Why did you choose that source of credit?
Have borrowed from them previously
Simple procedure to get loan
Have a contractual relationship with them in term of suppling feed, marketing cattle, or other tie-up.
Other reasons .....

5.13. a. Do you belong to a farmers' group ? Yes/No (explain)
.....
.....

Do you think that your participation in a farmers' groups gives easier access to finance for your cattle business, especially access to formal sources of credit? Yes/No. Why?
.....
.....

Appendix 3. Interview Questionnaires for Farmers

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA

(CASE STUDY EAST JAVA)

(INTERVIEW: FARMERS)

Name : _____

Village : _____

Sub District : _____

District : _____

Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE

THE UNIVERSITY OF QUEENSLAND

2016

I. The Characteristic of Farmers

1. Farmer's age :
2. Number of family members : (including respondent)
3. Education :
4. Primary job :
5. Secondary job :

II. Characteristics of The Cropping System

1. Experience in farming system :
2. Total land owned (m2) : ..... a. rice field .....; b. dry land .....
3. Are they certified ? How was the process? (explain in details)
4. What types of commodities do you grow?
5. Do you sell all of your products or use them by yourself?
6. What about the waste of those products (rice straw etc.)?

III. Characteristic of Cattle Production System

A. Management

1. Which type of cattle production that have been chosen when you started this business? (Cow-calf operation vs cattle fattening)
2. Why did you choose that cattle production?
3. When did you start involved in cattle fattening?
4. How many cattle do you have in total recently ?

Age		Owner			Keeper			Total	
		Type	Total	Value (IDR)	Type	Total	Value (IDR)	Total	Value (IDR)
Adult (> 2 year)	Male								
	Female								
Young (1-2 years)	Male								
	Female								
Calves (0-1 year)	Male								
	Female								

5. Do you want to increase your scale of production? How many cattle do you think that can give profit?

6. What you have been done to increase the scale of production? Is it successful?
7. How long you keep cattle for fattening? Why you choose that time?
8. Problem and solution when you starting cattle fattening

No	Obstacles	Solutions
1.	The availability of feeder cattle	
2.	The price of feeder cattle	
3.	Others	

9. Did you have experience in gaduhan system (keeping others farmers' cattle) ? How long? How was the benefit?
10. Do you want to continue the gaduhan (share owner and keeper) system? Why?

B. Marketing

11. How do you get feeder cattle?

No	Parameters	Explain in details why?
1.	Sellers	a. Local market: .....% b. Other traders: .....% c. Other actors: .....%
2.	Number of sellers and how to choose them	
3.	The criteria of feeder cattle	a. Local vs cross ..... b. Performans ..... c. The same age ? d. The same weight?
4.	The price of cattle	a. Weighing b. Estimation
5.	Mechanisme	a. Directly to sellers b. Through middle man ..... c. Buying feeder cattle collectively with other farmers, how?

12. How do you sell your cattle?

No	Parameters	Explain in details why?
1.	Buyers	a. Local market: .....% b. Other traders: .....% c. Other actors: .....%
2.	Number of buyers and how to choose them	
3.	The criteria of cattle to be sold	a. Time ..... b. Weight gain ..... c. Others .....
4.	The price of cattle	a. Weighing b. Estimation
5.	Mechanisme	a. The buyer approach the seller, or vice-versa b. Selling cattle collectively with other farmers, how?

13. The buying and selling prices received by farmers in particular season

Type of cattle		Buying price		Selling price	
		Certain market	Festival/ ceremony (.....)	Certain market	Festival/ ceremony (.....)
1. Adult	Local Male				
	Local Female				
	Crossbred male				
	Crossbred female				
2. Young	Local Male				
	Local Female				
	Crossbred male				
	Crossbred female				
3. Calves	Local Male				
	Local Female				
	Crossbred male				
	Crossbred female				

C. Feed Management

14. Types of feed given to cattle

No	Types of feed (explain)	Feed resources (buy, from the field, etc.)	Amount of feed (kg/day/head)
1.	Grass		
2.	Straw		
3.	Legumes		
4.	Concentrate		
5.	Others		

15. Are there any differences of feed between dry and wet season?

16. Do you apply feed technology to your business? Is it effective to improve the productivity of cattle production? How do you know that technology?

17. Do you make your own complete feed for cattle? What are the feed resources? (Explain in details) How do you know that knowledge?

D. Labour

18. Do you use non family labour to help you keeping cattle? In what condition? What factors affect you to hire non family labour to keep your cattle?

IV. The Transition of Cow-Calf Operation into Cattle Fattening

1. Have you had experience with cow-calf operation before? Do you still involve in cow-calf operation?

2. Why do you change your type of cattle production? Is it related to profit, the simplicity to do the business, trend, access to government subsidy, access to related infrastructure etc. ? (Explain in details)
3. Did you change the type of production suddenly with the medium or large scale of production?

or started by mixing fattening cattle with cow-calf operation?

4. How the impact of this transition from cow-calf operation into fattening cattle to your income?
5. If you keep both types of cattle production, do you think those support each of them?
6. Which one do you think more profitable for you?

IV. THE STRUCTURE OF FARMERS'INCOME

1. How many percentage the contribution of your cattle fattening to your total income?
2. If lower, why do you still want to do this business?
3. Did you try to improve your income from cattle fattening such as through expand the scale of production, use good quality feed and good management practises or other ways?

V. CREDIT

1. Type of credit received since 5 years

No	Type of credit	explain in details (type, year, name of product)	Sources (government, bank)
1.	Cattle distribution scheme		
2.	Subsidised credit		
3.	Commercial credit		

2. Why do you choose to accept that credit?
   a. It was offered by other farmers or follow the farmers group
   b. It is easy to apply in terms of requirement, process, etc. .....
   c. It is interesting credit scheme in terms of lower interest rate, administration fee etc...
   d. Other reasons .....
3. How do you use the money for? (explain the percentage)
   a. Buy feeder cattle
   b. Buy feed
   c. Build pens
   d. Other ways .....

4. For all money that you have applied how much money did you get?
   a. Exactly the same as you applied
   b. Only ..... percent because .....
   c. You got as much money as you applied but need to pay .....
   d. Others .....
5. When you apply credit, what do you need to be prepared?

No	Requirements	How to prepare, who help preparing, how long it takes
1.	Proposal	
2.	Budget simulation	
3.	Collateral and other requirements	
4.	Others	

6. Are there any problems in providing the requirements?
7. How to solve the problems?
8. How the process of applying credit?

No	Process	How long it takes, Who involved, how important each process
1.	Completing requirements	
2.	Process in bank	
3.	Visit borrowers	
4.	Disburse	
5.	Others	
6.		

9. Are there any problems in the process of applying credit?
10. How to solve the problems?
11. How is the scheme of credit repayment?

No	Requirements	Explain in details
1.	Time period	
2.	Grace period	
3.	Mechanisme of repayment	
4.	Pinalty if cannot repay credit	

12. Do you have any problems in the repayment of credit?
13. How do you solve those problems?

14. What do you think about these some factors ?

No	Items	Satisty, need to be improve, how?
1.	Credit limit	
2.	Interest rate	
3.	Administration fee	
4.	Collateral	
5.	Insurance company	

15. Do you think that credit is necessary to support your fattening operation?
16. What factors do you think that increase your willingness to apply credit or loan from bank?
17. Do you have any experience borrowing money from cattle traders or butcher or other actors who interact with you frequently?
18. How do you get those credit?

No	Informal credit	Explain in details
1.	The requirement/criteria	
2.	The process	
3.	The repayment	
4.	Others	

VI. GOVERNMENT POLICY

1. There are several policies from government (central and local government) to support livestock especially in cattle fattening production. Have you heard about that? What are they? .....
2. Do you think the program is effective and appropriate to help farmers who have limitation in capital? Or is it efective to improve your cattle production?
3. Did you face any problems when access one of those program from government?
4. What have you done to solve those problems?
5. Do you think that those programs from government increase your demand to credit or loan from banks? How?
6. Do you think that this scheme should be continue or stop?
7. If you want this program continue, how do you think to improve this scheme?

No	Government policy to support cattle fattening	What should be improved?
1.	Cattle distribution program	
2.	Sarjana Membangun Desa (SMD)	
3.	Subsidised credit	

VII. INSTITUTIONAL ASPECT

i. Do you participate in farmers group at the moment? How active?

ii. Why do you involve in farmers groups?

iii. What are the benefit participating in farmer groups?

No	Benefit participating in farmer groups	How?
1.	Access to technology	
2.	Access to supports from local/central governments	
3.	Access to credit	
4.	Acces to input production (feeder cattle, feed etc)	
5.	Share information	
6.	Others	

iv. Do you have any relationship with Dinas Peternakan/Dinas Pertanian/related institution? Do you get any supports from them in order to support your cattle fattening?

v. Do you have any relationship with Research Instituition? Do you get any supports from them in order to support your cattle production?

vi. Do you have any relationship with local institutional such as village leader?

vii. Do they help you in accessing credit?

viii. How the availability of institutional setting or participation on farmer group or other group affect the demand of credit or loan for cattle fattening?

Appendix 4. Interview Questionnaires for Banks

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA

(CASE STUDY EAST JAVA)

(INTERVIEW: BANKS)

Name : _____

Position` : _____

Institution : _____

District : _____

Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE

THE UNIVERSITY OF QUEENSLAND

2016

I. THE STRUCTURE OF BANK

1. Name of bank :

…….

2. Type of bank : Rural bank/commercial bank/sharia bank

Central office/regional/branch/supporting branch/unit

3. Bank has been operating since :

……

4. Personal status : Persero tbk/BUMD
5. Profit :
6. Basic capital :
7. Ownership :
8. Fund sources :
9. Assets :
10. Type of financial services : Savings, credit, other financial services (insurance, financial planning)
11. The responsibility of bank :
12. What are the differences between branches, supporting branch, unit office?
13. How much branches/supporting branches can be intervened by central/regional office? In terms of credit distribution etc…..

II. CREDIT

1. What types of credit are provided: (ask data for several last year)

No	Type of credit	Percentage	Target (IDR)	Realization (IDR)
1.	Investment			
2.	Working capital			
3.	Commercial			

2. What types of credit are provided: (ask data for several last year)

No	Type of credit	Percentage	Target (IDR)	Realization (IDR)
1.	Program credit			
2.	Retail			
3.	Commercial			
4.	Others			

3. Where does the source of fund come from?
4. How does the type of bank offices affect the supply of capital?
5. Who responsible for managing the distribution of credit?
6. What factors influence banks in distributing money for different types of credit?

7. What commodities or sectors can be funded by those credits?

8. How is the non performing loan of those types of credit?

9. Does NPL affect the status of offices or disbursement of credit in the future?

10. Are there any problems in disbursement of these credits?

11. How to solve those problems?

III. PROGRAM CREDIT

1. Does bank also provide program credit? What are they?

Type of program credit	Source of fund	Commodities or sectors can be funded	Percentage (target & realization)
KKPE (%)			
KUR (%)			
PMI (%)			

2. How this percentage affects the profit gained by banks?

3. Who determine the limit of credit for each program credit? What factors are considered?

4. Who determines the limit of credit for each types of bank offices? What factors are considered?

5. Who determines the limit of credit for each areas? What factors are considered?

6. How is the process of accesing those type of credit? (Explain in details)

No	Process of accessing credit	KKPE	KUR	PMI
1.	Criteria			
2.	Procedure			
3.	Assessment process			
4.	Repayment			

7. How is the non performing loan of program credit?

8. Does NPL affect the status of offices?

9. Are there any problems in disbursement of these credits?

10. How to solve those problems?

11. What are the differences between credit for livestock fattening and non-agricultural loans?

12. What is the main challenge for banks when assessing farmers?

13. Since program credit has been established, how much loan have been distributed for agriculture, livestock and cattle fattening?

14. What proportion of eligible farms take up that credit? How many farmers applied? How many groups and in what areas? (Ask for some data if possible)
15. Are there any differences between farmers who applied individually or in groups? Which one is more preferably for banks? Why?
16. How importance of these factor in accessing KKPE or other credit?
    a. Groups
    b. Technical support
    c. Assistance with economic assessment (e.g. basic budgeting)
    d. Endorsement of government/research
    e. Agribusiness links
17. There is an issue, that KKPE will end this year, why? Is it not effective for farmers? Or for banks?
18. Is there any new scheme of credit to change KKPE?
19. How is the process of this new scheme credit?

No	Process of accessing credit	(Explain in details)
1.	Criteria	
2.	Procedure	
3.	Assessment process	
4.	Repayment	

20. What is that? How is the process to access that new scheme credit?
21. What effort has been made and possible solutions tried to increase the supply of finance for cattle fattening?

V. INSURANCE COMPANY

1. For KUR, it involves quarantors company, who choose the institution?
2. How the mechanism of loan disbursement through quarantors company?
3. Is it effective for bank to use the company?
4. What happen if farmers can not return money or when NPL become high?
5. How to process the claim for insurance company?
6. How is the process to claim the loss from quarantors company?

VI. GOVERNMENT POLICY

1. What is the compensation if bank does not provide program credit?

2. How the process when determine program credit with the government?
3. Who determine the interest rate? Who determine the subsidy from government?
4. Related to subsidised credit (KUR, KKPE, KUPS etc.) from government, do you think it affects the demand for other credit (commercial credit)?
5. How those program affect the supply of credit for farmers?
6. What about the transaction cost or administration fee related to disbursement of subsidised credit?
7. Due to disbursement of credit involve quarantors company, is there any additional fee for that company?
8. Related to the government policy, What kind of policy from government that you need to increase the supply of credit for cattle fattening?

VII. INSTITUTIONAL ASPECT

1. How the availability of these institutional setting affect the supply of credit or loan for cattle fattening?
   a. Group farmers
   b. Dinas Peternakan or Dinas Pertanian
   c. Research institution
   d. Village leaders
2. Do applying credit through farmer groups reduce the transaction cost or administration fee?
3. Do you think that strong institutional setting give a positive effect to the assessment of credit?
4. Related to the institutional setting, what condition do you think that can increase the supply of credit for cattle fattening?
5. Related to the institutional setting, what condition do you think that can increase the willingness of farmers to apply credit from banks?

Appendix 5. Interview Questionnaires for Officials Villages

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA

(CASE STUDY EAST JAVA)

(INTERVIEW: VILLAGE LEADER/STAFF)

Name : _____

Position : _____

Institution : _____

District : _____

Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE

THE UNIVERSITY OF QUEENSLAND

2016

I. Structure of Village

1. What is the organization structure of village?

No	Position	Function	Determined by	Period of time in that position
1.	Village leader			
2.	Secretary			
3.	Treasurer			
4.	Others			

2. Does the village carry out regular meeting? What that is about?

II. The Role of Cattle Production

1. Do cattle have the important role in this area (as main income, saving, socio-cultural)?
2. How many percentage of households rely on cattle production in this area?

No	Types of production	Number of household	Percentage of household
1.	Cow-calf operation (CCO)		
2.	Cattle fattening		
3.	Both CCO and cattle fattening		
4.	Other livestock		

III. Program for Cattle Production

1. Do you have any programs to support cattle production in your areas?

No	Types of programs	Year	Source of fund	Number of household involved	Percentage of household involved
1.					
2.					
3.					
4.					

2. How to implement these programs?

No	Types of programs	Criteria	Process	Assessment	Repayment
1.					
2.					
3.					
4.					

3. How do farmers learn about this program?
    a. Any socialization?
    b. Who involve in this socialization?
    c. Who decided farmers/group farmers?
    d. Are there any pra survey to decide targe
4. How to monitor the progress of these programs
    a. Who involved
    b. How many times
5. Are there any obstacle to implement those programs?
6. How to solve those problems?
7. How was the response from community?
8. Did they participate in those programs?
9. How does this program influence the way farmers are keeping cattle? in terms of feed choices, management etc.?

III. Subsidised Credit for Cattle Fattening

1. Have you heard about KUR/KKPE for cattle production?
2. In relation to this, how the village support their community to access this credit?
    a. Give recommendation?
    b. Support for collateral?
    c. Manage farmers group?
    d. Others…..
3. Do the village involve in applying those scheme of credits? For example facilitating for livestock training etc.? Is it compulsory?
4. What is the benefit for village?
5. Do farmers who obtained credit should pay amount of money for the support from the village?
6. Do you think that the participation of village increase the demand for credit from farmers?
7. Do you think that the participation of village increase the supply of credit from banks?
8. Does Dinas and/or extension agents help farmers to apply loans, provide endorsement, provide technical support in lending groups?
9. What groups access finance, where, in what type of production systems?

Appendix 6. Interview Questionnaires for Agribusiness

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA

(CASE STUDY EAST JAVA)

(INTERVIEW AGRICULTURE ACTORS: TRADERS/BUTCHER/FEEDLOTTER)

Name : _____

Village : _____

Sub District : _____

District : _____

Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE

THE UNIVERSITY OF QUEENSLAND

2016

I. The Characteristics of Respondent

1. Type of respondent : Trader/butcher
2. Age :
3. Education level :
4. How long you have been a trader or butcher?
5. Do you have any other occupation?
6. Do you do this job by yourself or do your family involve in this job? Who are they?

II. Income

1. Selling cattle:

No	Traders	Answer	Butcher	Answer
1.	How many cattle market did you go per week		How many cattle did you slaughter per day	
2.	How many cattle did you sell per week		How many days per week	
3.	How much profit do you usually get per cattle		How much the profit per one cattle	

2. Did you also go to village (farmers' house) to get/sell cattle?

No	Source of feeder cattle	Percentage of cattle	Destination of cattle	Percentage of cattle
1.	Farmers		Farmers	
2.	Local market		Local market	
3.	Other actors		Other actors	

3. How many times per week?
4. Did you need other middle-man to get access to market?
5. How do you share the profit with that middle-man?

III. The Relationship with Farmers

1. How close is your relationship with the fatteners you deal with? (family, neighbors, friend)?

2. Services provided for farmers

No	Services	Source of capital (Own capital, government, banks)	How the contractual works
1.	Supply feeder cattle/ fattened cattle		
2.	Capital/credit		

3. Do farmers need collateral for that? In what form (interest rate, fee, the responsibility to sell or buy cattle from trader/butcher)?
4. How does it work? Is it effective to help farmers increase their income?
5. How many years have you provided those services?
6. When farmers sell or buy cattle from you, who determine the price of cattle?
7. What factors do you use to determine the price?
8. In your opinion, what are the common problems faced by farmers?
    a. Capital to expand the scale of production
    b. Feed quality, to increase the bodyweight of cattle
    c. Veterinary aspect to improve the quality of meat
    d. Others ….
9. What do you think the farmers need to develop their cattle fattening operations?
10. Do you also have link with trader/butcher? How close is that link? Are there any contract for supplying cattle?

IV. Perceptions About Availability of Credit for Cattle Fattening

1. Do you know that the government support farmers for their cattle production?
2. Have you heard about cattle distribution program, SMD, or CRS program from company to help farmers increase their income?
3. Do you think that these programs are effective to improve cattle production (farmers' income)?
4. How do you think these programs can be improved?
5. Do you know that the banks will supply subsidised credit for livestock (cattle fattening)?
6. Can you describe how these scheme operate?
7. In your opinion, what constraints faced by farmers to get credit for cattle fattening?
8. Have you ever applied for credit from government agencies or banks to support your cattle business? What kind of credit?

9. What factors do you think that made your application was successful or unsuccessful?
10. How was the process? (criteria, prosedure and repayment)?
11. Is that credit effective for you?
12. What factors do you think that can increase the supply of credit from banks?
13. What factors do you think that can increase the demand of credit from farmers?
14. In your opinion, what should be done by government (as a policy change) to support farmers'cattle business?
15. In your opinion, what is the best scheme credit for farmers?
16. What is the role of agribusiness (such as marketing agencies, traders, butchers, feedlots)
17. How they influence cattle fattening households in increasing the take up of finance for cattle fattening?
18. What is the role of agribusiness (such as marketing agencies, traders, butchers, feedlots) in helping farmers develop their businesses?
19. What is the role of institution such as livestock farmers' groups in helping farmers develop their businesses?
20. What other supports that is currently not provided is needed by farmers to develop their bussinesses
    a. From research institutions
    b. Government
    c. Agribusiness agencies
    d. Other institutions

Appendix 7. Interview Questionnaires for Government

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA

(CASE STUDY EAST JAVA)

(INTERVIEW GOVERNMENT: CENTRAL & LOCAL)

Name : _____

Position : _____

Institution : _____

District : _____

Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE

THE UNIVERSITY OF QUEENSLAND

2016

I. GOVERNMENT PROGRAMS TO SUPPORT CATTLE PRODUCTION

1. What are the government's efforts to increase cattle production in Indonesia in regard to:
   a. Cattle productivity?
   b. Feed supply?
   c. Breeds/the supply of feeder cattle?
   d. Animal Health?
   e. Public health, slaughter house procedures, meat delivery, etc?
   f. Financial assistance to cattle producers?
   g. Marketing/access to market?
   h. Other matters?
2. In relation to finance, how is the government supporting cattle production?
   a. Providing cattle (through the cattle distribution scheme):
   b. Providing a subsidised/commercial credit scheme:
   c. SMD:
   d. Any other ways
3. Specifically for cattle fattening, how the government support finance?
   a. Providing feeder cattle (cattle distribution scheme):
   b. Providing subsidised/commercial credit scheme (KKPE/KUR):
   c. Influence banks to provide credit for farmers:
   d. Influence company such as palm oil estate to provide CSR (corporate social credit) for farmers:

II. CATTLE DISTRIBUTION SCHEME

1. When did this programs get started?
2. How much funding is budgeted for cattle distribution per year? How's the realization?
3. What type, ages of cattle are distributed?
4. Source of cattle
5. Who is involved in this program? (livestock services, local government, farmer groups)
6. Is there any training for those actors involved in this program?
7. What is included in this scheme?
8. How do farmers learn about this program?
   a. Any socialization?

b. Who involved in this socialization?
c. Who decided farmers/group farmers?
d. Are there any pra survey to decide target

9. How do farmers apply for this cattle distribution?
10. Who help farmers applying this credit? Who help farmers for the proposal? Is it simple application?
11. Does Dinas and/or extension agents help farmers to apply for loans, provide endorsement, provide technical support in lending groups?
12. What are the criteria of farmers who involved in this scheme?
13. Do they need collateral ?
14. Are there any administration fee or other cost that should be provided by farmers?
15. How should the sustainability of cattle credit schemes be monitored? Who monitor this? How?
16. Do you have any relationship with research institution or from Dinas Peternakan to implement this program together?
17. What is the mechanism by which farmers repay/return cattle received from the government?
18. How does this program influence the way farmers are keeping cattle? in terms of feed choices, management etc.?
19. Until now, how many cattle have been distributed for fattening ?
20. How many cattle have been returned by farmers? How those cattle have been distributed to other farmers?
21. What groups access finance, where, in what type of production systems?
22. How does the cattle distribution scheme impact on the development of cattle fattening in Indonesia, income of farmers?
23. Do you think that this program is appropriate for cattle fatteners?
24. What are constraints in this program?
25. What has been done to overcome those constraints? Is it effective? Do you think that this program should be improved? How?

III. CREDIT SCHEMES FOR CATTLE FATTENING

1. Type of credit : subsidised/commercial
2. When was this program started?
3. How much credit is distributed per year? And how many farmers took advantage of it?

4. Source of credit, subsidised?
5. Who is involved in this program?
    a. Banks
    b. Local government/other institutions
    c. Group farmers
    d. Others
6. What is included in this scheme? (assisstance)?
7. What is the interest rate?
8. What other transaction costs do the farmers need to meet? What Administration fees apply?
9. How do farmers learn about this program?
    a. Any socialization from the government?
    b. Who involve in this socialization?
10. How do farmers apply for this assistance?
11. What are the criteria to apply this credit?
    a. Is there any training for those actors involved in this program?
    b. Is Any collateral security?
    c. Is there a Simple application process?
    d. Who help farmers making an application?
12. How do you provide the subsidy for credit?
13. How does this program influence the way farmers keep cattle ? in terms of feed choices, management etc.?
14. How to monitor the banks? Is there a regular monitoring?
15. How should the sustainability of cattle credit schemes be monitored?
16. What is the mechanism by which farmers repay their loans?
17. Does Dinas and/or extension agents help farmers to apply for loans, provide endorsement, provide technical support in lending groups?
18. How much credit has been distributed to farmers for fattening cattle since the scheme started?
19. What groups access finance, where, in what type of production systems?
20. How has the cattle credit scheme contributed to the development of cattle fattening in Indonesia, income of farmers?
21. Do you think that this program is appropriate for farmers wanting to fatten cattle?
22. Are there any obvious Constraints to achieving success in this program?
23. What Efforts have been made to overcome those constraints?

24. In your opinion, how these program affect the demand of farmers to apply credit from bank?
25. How these programs affect the supply of credit from banks?

Note:

1. Need to ask the report of KKPE program
2. Need to ask other new program ”Sentra Peternakan Rakyat” (Public Livestock Centre).

Appendix 8. Interview Questionnaires for Research Institutions

QUESTIONNAIRES

No:

IMPROVING FINANCE FOR CATTLE FATTENING IN INDONESIA

(CASE STUDY EAST JAVA)

(INTERVIEW: RESEARCH INSTITUTION)

Name : _____

Position : _____

Institution : _____

District : _____

Province : _____

Date : _____

SCHOOL OF AGRICULTURE AND FOOD SCIENCE

THE UNIVERSITY OF QUEENSLAND

2016

I. GOVERNMENT PROGRAMS TO SUPPORT CATTLE PRODUCTION

1.1. What are the government's efforts to increase cattle production in Indonesia in regard to:

- Cattle productivity? ……
- Feed supply? ……..
- Breeds? ……
- Animal Health? ……...
- Public health, slaughter house procedures, meat delivery, etc? ……
- Financial assistance to cattle producers? ..……
- Marketing? ……..
- Other matters? ……

1.2. In relation to finance, how is the government supporting cattle production?

- Providing cattle (through the cattle distribution scheme): ……
- Providing a subsidised/commercial credit scheme: ……..
- Any other ways ……...

1.3. Specifically for cattle fattening, how the government support finance?

- Providing cattle (cattle distribution scheme): ……
- Providing subsidised/commercial credit scheme: ……
- Influence banks to provide credit for farmers: ……...
- Influence company such as palm oil estate to provide CSR (corporate social credit) for farmers: ……..

II. CATTLE DISTRIBUTION SCHEME

2.1. Characteristics of the cattle distribution scheme

No	Questions	Answers (explanation)
a.	When did this programs get started?	
b.	How much funding is budgeted for cattle distribution per year?	
c.	What type, ages of cattle are distributed?	
d.	Source of cattle	
e.	Who is involved in this program? - Livestock Services - Local government/institutions - Group farmers - Others	
f.	Is there any training for those actors involved in this program?	
g.	What is included in this scheme?	

2.2. Mechanism of scheme

No	Questions	Answers (explanation)
a.	How does this program influence the way farmers are keeping cattle? in terms of feed choices, management etc.?	
b.	How do farmers learn about this program? - Any socialization? - Who involve in this socialization? - Who decided farmers/group farmers? - Are there any pra survey to decide target	
c.	How do farmers apply for this cattle distribution? - Simple application? - Who help farmers? - Any collateral? - Administration fee?	
d.	How should the sustainability of cattle credit schemes be monitored? - Any assistance (from technology)?	
e.	What is the mechanism by which farmers repay/return cattle received from the government?	
f.	Does Dinas and/or extension agents help farmers to apply for loans, provide endorsement, provide technical support in lending groups?	

2.3. The progress of this program

No	Questions	Answers (explain)
a.	How many cattle have been distributed for fattening?	
b.	What groups access finance, where, in what type of production systems?	
c.	How does the cattle distribution scheme impact on the development of cattle fattening in Indonesia, income of farmers?	

2.4. Do you think that this program is appropriate for cattle fatteners?
.....

2.5. Constraint in this program? .....

2.6. What has been done to overcome those constraints? .....

III. CREDIT SCHEMES FOR CATTLE FATTENING

3.1. Type of credit : subsidised/commercial .....

3.2. Characteristics of scheme

No	Questions	Answers (explanation)
a.	When was this program started?	
b.	How much credit is distributed per year? And how many farmers took advantage of it?	
c.	Source of credit, subsidised?	
d.	Who is involved in this program? - Banks - Local government/other institutions - Group farmers - Others	
e.	Is there any training for those actors involved in this program?	
f.	What is included in this scheme? (assisstance?)	
g.	What is the interest rate? What other transaction costs do the farmers need to meet?	

3.3. Mechanism of scheme

No	Questions	Answers (explanation)
a.	How does this program influence the way farmers keep cattle ? in terms of feed choices, management etc.?	
b.	How do farmers learn about this program? - Any socialization from the government? - Who involve in this socialization?	
c.	How do farmers apply for this assistance? - Is there a Simple application process? - Who help farmers making an application? - Is Any collateral security? - What Administration fees apply?	
d.	How should the sustainability of cattle credit schemes be monitored? - Any assistance (from technology)?	
e.	What is the mechanism by which farmers repay their loans?	
f.	Does Dinas and/or extension agents help farmers to apply for loans, provide endorsement, provide technical support in lending groups?	

3.4. The progress of this program

No	Questions	Answers (explanation)
a.	How much credit has been distributed to farmers for fattening cattle since the scheme started?	
b.	What groups access finance, where, in what type of production systems?	
c.	How has the cattle credit scheme contributed to the development of cattle fattening in Indonesia, income of farmers?	

3.5. Do you think that this program is appropriate for farmers wanting to fatten cattle?
.....

3.6. Are there any obvious Constraints to achieving success in this program?
.....

3.7. What Efforts have been made to overcome those constraints?
.....

C. Publications